

2022-03

# Covid 19 Vaccine Hesitancy and it`S Associated Factors in Awi Zone, North West Ethiopia

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COLLEGE OF MEDICINE AND HEALTH SCIENCES, SCHOOL OF  
PUBLIC HEALTH

COVID 19 VACCINE HESITANCY AND IT`S ASSOCIATED FACTORS IN  
AWI ZONE, NORTH WEST ETHIOPIA

A THESIS SUBMITTED TO BAHIR DAR UNIVERSITY COLLEGE OF  
MEDICINE AND HEALTH SCIENCES AS PARTIAL FULFILMENT OF  
THE REQUIRMENTS FOR THE DEGREE OF MASTER OF PUBLIC  
HEALTH.

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MARCH, 2022  
BAHIRDAR, ETHIOPIA



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Full title of the research Project	Covid 19 vaccine hesitancy and its associated factors in Awi zone, North west Ethiopia, 2021
Duration of the study	May to July 2021
Study area	Awi zone, North west Ethiopia
Total cost of the study	38,850 Birr

March, 2022  
BAHIRDAR, ETHIOPIA

## **ACKNOWLEDGEMENTS**

I would like to express my deepest gratitude to my advisers Mr. Getasew T. (MPH) and Mr. Habtamu A. (MPH) for their relevant and constructive comments in this thesis development.

I also would like to acknowledge Awi Zone Health department and district health offices for their co-operation in giving relevant background information for this thesis development.

Finally I would like to acknowledge Bahir dar University College Medicine and Health Sciences School of public health department of General public health for giving me this opportunity.

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## **LIST OF ACRONYMS**

African CDC: African Centre for Disease Control and prevention

ANRS: Amhara national regional state

APHI: Amhara public health institute

Covid 19: Corona virus disease 2019

DR Congo: Democratic republic of Congo

SARS: Severe Acute Respiratory Syndrome

SARS-CoV-2: Severe acute respiratory syndrome coronavirus-2

SPSS: Statistical Package for Social Sciences

WHO: World Health Organization

NPIs: Non-pharmaceutical interventions

ZHD: Zonal Health Department

ODK: Open data kit

SAGE: Strategic Advisory Group of Experts on immunization

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## Abstract

**Background:** Since the emergence of COVID 19 in Wuhan, China, in December 2019 the disease has been declared as a global pandemic and has been associated with the deaths of more than 3 million people around the world. It continues to be a dynamic and evolving pandemic. Due to the development and initiation of vaccination, currently significant difference upon vaccine acceptance is seen between developed and developing countries. However, there are no data on the level of COVID-19 vaccine hesitancy and its associated factors in Awi zone. The overall objective of this study is to determine level of vaccine hesitancy and its associated factors in Awi zone, Amhara region, Ethiopia.

**Methods:** A Community based cross-sectional study design conducted from September 1 to October 1, 2021 in Awi zone Northwest Ethiopia. A multi stage sampling method used to select Districts and kebeles. A total of 393 individuals participated in this study; each was drawn by multistage sampling technique. The data was collected using interviewer administered structured questioner with ODK Collect v1.23.3 and exported to SPSS 23 for analysis.

**Results:** Out of the 393 people who took part in the survey, less than half 149 (37.9%) said they would not accept COVID-19 vaccines, and more than half (62.1%) said they would. Male sex (aOR= 1.73, 95% CI: 1.03, 2.91), rural residential place (aOR=2.80, 95% CI: 1.53, 5.12). Information source from social media (aOR=8.70, 95% CI: 2.64, 28.59) Information source from mass media (aOR=5.44, 95% CI: 1.81, 16.31), having Concern on safety of vaccine (aOR=1.44, 95% CI: 1.78, 2.64) and effectiveness of Covid 19 vaccines (aOR=6.40, 95% CI: 3.43, 11.95) were significantly associated with Covid 19 vaccine hesitancy.

**Conclusion:** There is a growing trend of Covid 19 vaccine hesitancy; the government with different stakeholders should design interventions in terms of awareness campaigns via all types of multimedia to spread more transparent information about the safety and efficacy of the vaccines.

**Keywords:** Vaccine hesitancy, Vaccine acceptance, anti-vaccination, Covid 19, Corona Virus

# 1. Introduction

## 1.1 Background

The recently emerged novel coronavirus, “severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2)”, caused a highly contagious disease called coronavirus disease 2019 (COVID-19). The virus was first reported from Wuhan city in China in December, 2019, which in less than three months spread throughout the globe and was declared a global pandemic by the World Health Organization (WHO) on 11th of March, 2020(1). COVID-SARS-2 pandemic has struck and spread at light speed, reaching 6 continents within 3 months, transforming our societies globally. In 6 months, numbers rose exponentially to 5,159,674 cases and 335,4186 fatalities (6.5%) (2, 3).

The virus is transmitted through large droplets generated during coughing or sneezing of symptomatic and asymptomatic patients (4). Therefore, frequent hand-washing with soap and water, using alcohol based hand rub or sanitizer, avoidance of hand shaking/public gathering and use of face mask are crucial to halt the spread of COVID-19(5). An essential tool for controlling the on-going COVID-19 pandemic is the availability of efficacious vaccine(s), which can help in reducing transmission, hospital admissions and the demand on intensive care(6). But vaccine hesitancy is becoming an important obstacle for preventive strategies for combating infectious diseases, and is seen frequently for the prospective SARS-CoV-2 vaccines (7, 8). Vaccine hesitancy is the term used to define refusal or reluctance in the acceptance of vaccination despite the availability of vaccination services (9). The modern endorsement of vaccine hesitancy is a well-known phenomenon, with older roots that have accompanied vaccination since its scientific inception (10, 11).

Thus, the availability of safe and effective vaccines is insufficient; vaccines have to be widely accepted by the public and by the health care community to confer population benefit. (12) Mounting evidence teaches that segments public experience some degree of hesitancy about accepting vaccination.<sup>3</sup> Indeed, vaccination hesitancy, lack of confidence in vaccination, and/or complacency about vaccination that may lead to delay in acceptance or refusal of vaccination despite access to vaccination services was deemed a top 10 threat to global health by the World Health Organization in 2019 (10, 11). Although this designation preceded the

COVID-19 pandemic, the socio-political response to the pandemic in many countries provides a timely example of this threat (12).

Vaccination confidence is influenced by trust in the safety and effectiveness of vaccines, trust in health care professionals and public health and health care delivery systems, and trust in the policymakers who develop vaccination requirements (12). Experts have noted a decline in public confidence in vaccination. Vaccination complacency is influenced by individuals' health beliefs (e.g., perceived risk of vaccination, perceived risk and severity of disease, perceived need for the vaccine, and self-efficacy of vaccination) and their assessment of the risks and benefits of vaccination. Ironically, the success of vaccination has contributed to such complacency by reducing perceived risk and severity of disease (11, 13, 14).

Despite these efforts to decrease the burden of COVID-19 through vaccination and other measures, vaccine reluctance is increasing worldwide and hindering efforts to control its spread (13, 14). The main sources of this vaccine hesitancy may be due to a substantial amount of misinformation regarding the COVID-19 vaccine circulating on social media, which is augmented by an existing general high level of vaccine misinformation (2, 3).

## 1.2 Statement of the problem

Utility of vaccine campaigns to control COVID-19 is not merely dependent on vaccine efficacy and safety. Vaccine acceptance among the general public appears to have a decisive role in the successful control of the pandemic(12). Earlier studies that assessed attitudes towards vaccines revealed the existence of regional variability in perceiving the safety and effectiveness of vaccination (11, 13, 14). Higher-income regions were the least certain regarding vaccine safety with 72%–73% of people in Northern America and Northern Europe who agreed that vaccines are safe. This rate was even lower in Western Europe (59%), and in Eastern Europe (50%), despite the presence of a substantial variability in Eastern European countries (from 32% in Ukraine, 48% in Russia, to 77% in Slovakia). However, the majority of people in lower-income areas agreed that vaccines are safe, with the highest proportions seen in South Asia (95%) and in Eastern Africa (92%) (15). A similar pattern was observed regarding vaccine effectiveness, with Eastern Europe as the region where people are the least likely to agree that vaccines are effective, as opposed to South Asia and Eastern Africa (15, 16).

African CDC study in 15 African countries shows Ethiopia, Niger and Tunisia reported the highest levels of willingness to take a COVID-19 vaccine (over 9-in-10 in these countries) compared to less than 6-in-10 in DR Congo. Nigeria falls into the bottom half of countries in terms of willingness to take a COVID-19 vaccine (76% say they would get it) but returned high scores for confidence in the importance, safety and efficacy of vaccines in general (17). Earlier study in Addis Abeba showed that about one out of five participants are not willing to receive COVID-19 vaccine(18).

The complex nature of motives behind vaccine hesitancy can be analysed using the epidemiologic triad of environmental, agent and host factors (19, 20). Environmental factors include public health policies, social factors and the messages spread by the media (21-23). The agent (vaccine and disease) factors involve the perception of vaccine safety and effectiveness, besides the perceived susceptibility to the disease (22, 24, 25). Host factors are dependent on knowledge, previous experience, educational and income levels (20, 26).

To identify the scope of this problem, this community based cross sectional study will aim to assess the hesitancy rates for COVID-19 vaccine(s) in Awi zone, North West Ethiopia, Which can provide an initial step to study the factors implicated in regional and cultural differences behind COVID-19 vaccine hesitancy.

### 1.3. Significance of the study

Studying the event of vaccine hesitancy including willingness to accept COVID-19 vaccines could be complicated by the multifaceted nature of this phenomenon(9). This entails the existence of cognitive, psychological, socio-demographic and cultural factors that contribute to vaccine hesitancy (27-30). Analysis of such factors is needed to address COVID-19 vaccine hesitancy, following the assessment of the scope and magnitude of this public health threat(31). This can help in guiding interventional measures aimed at building and maintaining responses to tackle this threat(32).

The COVID-19 vaccination program is considered Africa's and Ethiopia's largest-ever immunization program(17), and people was asked to get vaccinated voluntarily, possibly in a way that they have never been asked before. Therefore, it is of paramount importance to understand how people plan to reject COVID-19 vaccines and the reasons behind their decision. Accomplishing this will help identify types of effective communication and awareness campaigns that might successfully convince people to accept vaccination services. Furthermore, it is vital to equip vaccinators and healthcare providers with strong interpersonal and communication skills and relational approaches to support their effort in addressing trust issues that might prevent vaccination compliance in communities and households(33). The latest estimates on COVID-19, pointed out a range of 60–75% immune individuals that would be necessary to halt the forward transmission of the virus and community spread of the virus (34, 35).

Despite the huge public health importance recommendation by different papers like the African CDC study which recommends regional studies, there has been no quantitative study done so far to determine its level in Awi zone. Thus, the importance of the studying the level of vaccine hesitancy is vital in gaining more knowledge and help the betterment of the society.

Estimates of vaccine acceptance rates can be helpful to plan actions and intervention measures necessary to increase the awareness and assure people about the safety and benefits of vaccines, which in turn would help to control virus spread and alleviate the negative effects of this unprecedented pandemic.

## 2. Literature Review

### 2.1. Covid 19 pandemic and Vaccine hesitancy

The pandemic has resulted in a devastating impact worldwide, which prompted the need for mitigation policies to contain the pandemic (36). The ground strategy followed by most countries around the world was to reduce the transmissibility of the disease, often by non-pharmaceutical interventions (NPIs), including enforcing masks policy, hands sanitization, social distancing, travel restrictions, schools' closures, and partial or complete lockdowns (37). So far, NPIs were able to slow down the progression of the disease, but the most promising strategy to confine the pandemic and providing hope to reduce the mortality and morbidity rates remains within the capacity of medical technology. Such medical technology includes effective, safe, and affordable antiviral agents and vaccines. As of December 2020, no antiviral drugs have been approved that were specifically developed against SARS-CoV-2 (38).

In times of disease outbreaks and pandemics, vaccination is a crucial public health intervention that stands at the juncture between an individual's decision and community immunity. As a result, the success of a vaccination program lies in the people's level of acceptance. Vaccine hesitancy, which is the reluctance to accept available vaccines, has been listed by the WHO as one of the top ten threats to health and well-being in 2019(9, 39). Some studies point out that vaccine hesitancy is driven by cultural, social, historical, political, and individual factors such as emotions, values, risk perceptions, knowledge, or belief (40, 41). Interestingly, Africa is a continent with multicultural patterns, and this diversity in cultural beliefs and practices spreads across different states, nations, races, tribes, and ethnic groups (42). Sociocultural and demographic influences thrive in Africa owing to the culture and social structure, where people are strongly influenced to believe or accept what others do or expect them to do (42).Undoubtedly, this sociocultural complexity has contributed immensely to sporadic vaccine hesitancy in Africa. Hence, like all vaccines, hesitancy to COVID-19 vaccines is also expected to vary ultimately, in different contexts, as well as in different patterns (39, 43).

## 2.2. Covid 19 vaccine hesitancy rates

Vaccine hesitancy can be a decisive factor that would hinder the successful control of the current COVID-19 pandemic (8, 44). Thus, estimates of vaccine acceptance rates can be helpful to plan actions and intervention measures necessary to increase the awareness and assure people about the safety and benefits of vaccines, which in turn would help to control virus spread and alleviate the negative effects of this unprecedented pandemic (3, 45). Evaluation of attitudes and acceptance rates towards COVID-19 vaccines can help to initiate communication campaigns that are much needed to strengthen trust in health authorities (31).

### 2.2.1. The global trend

The assessment of regional differences can be invaluable in addressing and fighting public health threats posed by vaccine hesitancy (46). A poll that was conducted in the US, where 50% of the Americans said they are willing to take the vaccine, 30% are unsure, while 20% are refusing the vaccine (47). In another survey of adult Americans, 58% intended to be vaccinated, 32% were not sure, and 11% did not intend to be vaccinated (48). However, one more study reported 67% of the Americans would accept a COVID-19 vaccine if it is recommended to them, although there were significant demographic differences in vaccine acceptance(49).

A concise systemic review of 30 published papers found sizable number of studies reported COVID-19 acceptance rates below 60%, which would pose a serious problem for efforts to control the current COVID-19 pandemic. Low COVID-19 vaccine acceptance rates were more pronounced in the Middle East, Eastern Europe and Russia(16). In East and South East Asia, the overall acceptance rates among the general public were relatively high. This includes more than 90% acceptance rates in Indonesia, Malaysia and one study from China (50-52). Another two surveys on the general public in China reported vaccine acceptance rates of more than 80%, with an additional survey in South Korea that reported a rate of 79.8% (53, 54). A later survey from Shenzhen, China, by Zhang et al., which surveyed parents/guardians who were factory workers, on their acceptability of children COVID-19 vaccination reported a lower rate of 72.5% compared to previous studies(55). Similarly, an online survey on Australian parents showed an acceptance rate of 75.8%, dropping from a rate of 85.8% in April among adults in Australia who were surveyed in April 2020 (56, 57). The lowest COVID-19 vaccine acceptance rate among the general public in the region was reported by Lazarus et al., in Singapore (67.9%). The relatively high rates of vaccine

acceptance in the region were attributed to strong trust in governments(53). Additionally, the only survey in India reported a vaccine acceptance rate of 74.5% (53). The relatively high rates of COVID-19 vaccine acceptance might be related to stronger confidence in vaccine safety and effectiveness, as reported previously in Asia (24).

### **2.2.2. The trend in Africa**

Two surveys among the general public in African countries reported an acceptance rate of 81.6% in South Africa and 65.2% in Nigeria (53). In sub-Saharan Africa, surveys have reported 84.6% of Cameroonians, 52% of South Africans, and 50% of Zimbabweans to be hesitant or would reject the COVID-19 vaccine(58, 59).

Recently, a survey that studied people's perceptions on COVID-19 vaccines was conducted in 15 African countries (Burkina Faso, Cote d'Ivoire, Democratic Republic of the Congo, Ethiopia, Gabon, Kenya, Malawi, Morocco, Niger, Nigeria, Senegal, South Africa, Sudan, Tunisia, and Uganda) by the Africa Centres for Disease Control and Prevention in partnership with the London School of Hygiene & Tropical Medicine and Orb International. Sample sizes of about 1000 people, with a mix of genders and age-groups from both urban and rural populations, served as a national representative of each country. The results showed that about 80% of the people are willing to accept COVID-19 vaccine once it is available and considered safe and effective. Although the overall results were encouraging, there were significant regional differences across Africa. Ethiopia and Niger recorded the highest willingnessd94% and 93%, respectively whereas only 65% and 59% of the surveyed people in Senegal and Democratic Republic of the Congo, respectively, would be willing to take a vaccine(17). If compared with other areas of the world, the results show tremendous levels of willingness(60). However, there is concern that vaccine opponents could influence the 'fence-sitters' who are still uncertain about whether they will eventually accept it(60).

Furthermore early knowledge, attitudes and practices survey study towards COVID-19, from North-Central Nigeria, reported an acceptance rate of barely 29.0%, which highlights the need for more studies for an accurate depiction of COVID-19 vaccine hesitancy in Africa due to possible large regional and sub-regional variations (61).



### **2.2.3. The trend in Ethiopia**

Ethiopia reported the highest willingness to accept a new COVID-19 vaccine across the 15 countries surveyed by African CDC, over 9-in-10 (94%) saying they would be willing to take the vaccine. Regional differences are evident as the predominant majority in Tigray (97%) and Oromia (96%) say they would accept such a vaccine, while in Afar 87% reported willingness(17). While the above study shows only 4% hesitancy levels another study in Addis Abeba report significantly higher level of hesitancy as 19.1% of participants responded not willing to take Covid vaccines.

Despite the huge public health importance, there has been no quantitative study done so far to determine its impact in Awi zone on the general public.

## **2.3. Factors associated with vaccine hesitancy**

### **2.3.1. Socio-demographic factors**

Demographic and socio-economic factors that determine vaccine hesitancy include age, level of education, and socio-economic status (29, 53, 62). Global studies show women tend to be less inclined to vaccinate which is consistent with study conducted by African CDC in 15 African states which founds Men are more likely to report they would take a COVID-19 vaccine (80%) compared to women (78%) (17, 63). Similarly study in Ethiopia's capital city Addis Abeba found with multi-variable analysis COVID-19 vaccine hesitancy was associated with sex, attitude and source of information about the vaccine. It was found that the odds of vaccine hesitancy was 1.97 times (OR=1.97; 95% CI: 1.10 - 3.89, p=0.03) higher among female participants as compared to male participants(18). This can be related to their higher perception of COVID-19 dangers and lower belief in conspiratorial claims surrounding the disease.

The much higher levels of doubt about the safety of a COVID-19 vaccine, compared to general vaccinations are evident across all genders, age groups and educations levels. Young people, those with a secondary or university education, and people who live in big cities are more likely to believe that a COVID-19 vaccine is unsafe. Scepticism about the safety of the COVID-19 vaccine is also higher among people who use social media as a trusted source of information, those who believe COVID-related conspiracy theories and people who report seeing disinformation about the virus (7, 17, 18, 62).

In terms of education and employment, respondents with a secondary level education are less likely to accept a COVID-19 vaccine (78%) compared to those with a primary education (81%) and university graduates (80%). Those who are unemployed reported being less willing to take the vaccine (77%) than respondents who were working (80%)(17).

### **2.3.2. Vaccine Confidence and the Impact of COVID-19**

Perceived importance of vaccination and confidence is a well-known individual determinant of vaccine acceptance (22). These behaviours are now being tested with the emergence of Covid 19 and when people asked if the global Coronavirus outbreak has made them more or less likely to vaccinate themselves in general. Almost half of respondents in one survey report that they are now more likely to vaccinate, with the highest proportions in Ethiopia (87%) and Sudan (69%). However, the pandemic has pushed some people in the opposite direction, with 1-in-6 (overall) declaring that they are now less likely to vaccinate than before the outbreak. Nonetheless, 1-in-3 states that the pandemic has not changed their views on vaccines(17).

Having a direct experience of COVID-19 seems to increase the likelihood of people vaccinating themselves. A greater proportion of respondents who know someone who has tested positive for COVID-19 say they are now more likely to vaccinate, compared to those with no experience of the virus. Interestingly, having a family member test positive for COVID-19 appears to have a greater positive impact on people's willingness to vaccinate, than personal experience of the virus (2, 17, 43, 50, 59, 62).

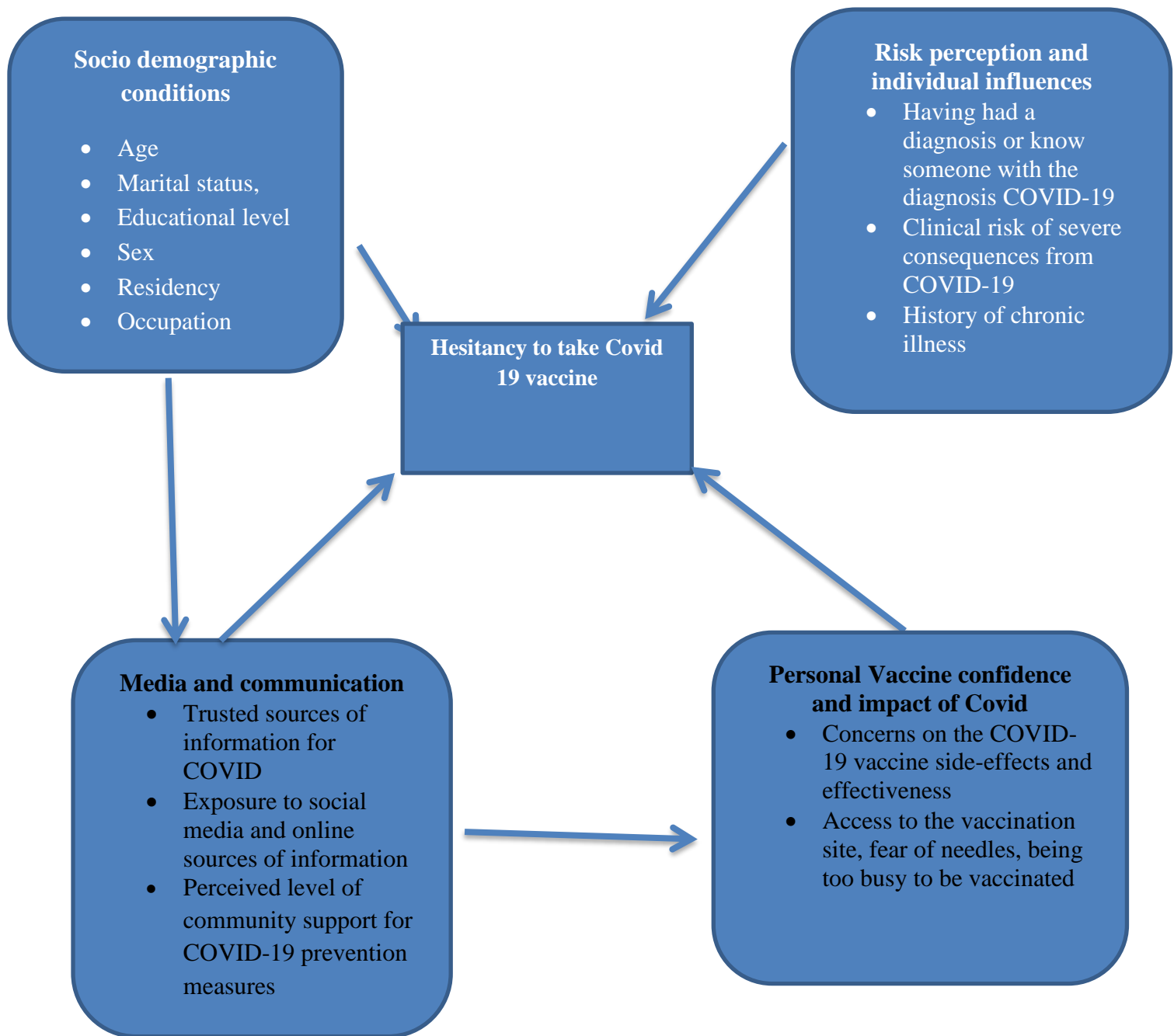
It seems that the pandemic and associated public discussion around the pandemic has exacerbated existing views. Those who disagree that vaccines are safe in general are more likely to have been put off vaccinations, while those who view them as safe are more likely to say the pandemic would encourage them even more to pursue vaccination. These safety concerns are explored further in the following section (17, 20, 44, 53). Moreover people who had concerns over COVID-19 vaccines' side-effects and effectiveness were more likely to be vaccine hesitant(53, 64). This highlights the prevailing environment where there is heightened concern about the effectiveness and side effects of COVID-19 vaccines.

### **2.3.3. The role of media and communication**

In a well-written book, the journalist Seth Mnookin explains how vaccination has become a source of fear and a target for misinformation(65). Looking at the history of vaccination in the United States and the United Kingdom, he shows how media have played a role in keeping vaccination scares alive, even in face of strong evidence of the safety and effectiveness of vaccines. Indeed, many scientific studies have demonstrated the negative influence of media controversies on vaccine uptake (11, 65, 66).

Studies conducted to assess health protective behaviours and conspiracy theories during the pandemic found that there was significant association between holding a conspiracy belief and checking social media for news of COVID 19 which in turn pushes people to be more hesitant in receiving vaccines(18, 62). Mixed cross sectional study which was the first community based study on the topic in Ethiopia reported participants who received their information from social media (internet) were more likely to have vaccine hesitancy as compared to those who got their information only from TV/radio. This finding of the study is in line with a study conducted to assess health protective behaviours and conspiracy theories during the pandemic found that there was significant association between holding a conspiracy belief and checking social media for news of COVID 19(18, 67) . Younger people who rely more heavily on online sources are more likely to mention social media when it comes to disinformation-targeting. Those who think vaccines are unsafe as well as those who have not had vaccinations tend to get their disinformation-targeting from social media (7, 17).

### 3. Conceptual framework



**Fig 1:** Conceptual framework of Covid 19 vaccine hesitancy in Awi zone, 2021 (17, 33, 60, 62, 68, 69).

## **4. OBJECTIVES**

### **4.1. General objective:**

To determine Covid 19 vaccine hesitancy and associated factors in Awi zone, Northwest Ethiopia, 2021.

### **4.2. Specific objectives:**

1. To determine magnitude of vaccine hesitancy for COVID-19 vaccines in Awi zone, Northwest Ethiopia, 2021.
2. To identify factors associated with Covid 19 vaccine hesitancy among residents of Awi zone, Northwest Ethiopia, 2021.

## **5. METHODOLOGY**

### **5.1. Study area and period**

The study was carried out in Awi zone, Northwest Ethiopia. Awi Zone is located 112.7km far from the capital city of Amhara region Bahir dar and 445.8 Km from Addis Ababa. Based on the central statistical agency (CSA) population projection from the 2011 population and housing census, the Awi catchment population is about 1,248,815 of which 625,164 are males and 623,651 are females. 86 % of the populations live in rural areas. Awi Zone has 13 rural districts, 5 town administrations. All districts have initiated first round Covid 19 vaccine for health professionals and high risk population groups. The study was undertaken from September to August 2021 in three randomly selected districts and three town administration of Awi zone of the ANRS, Ethiopia.

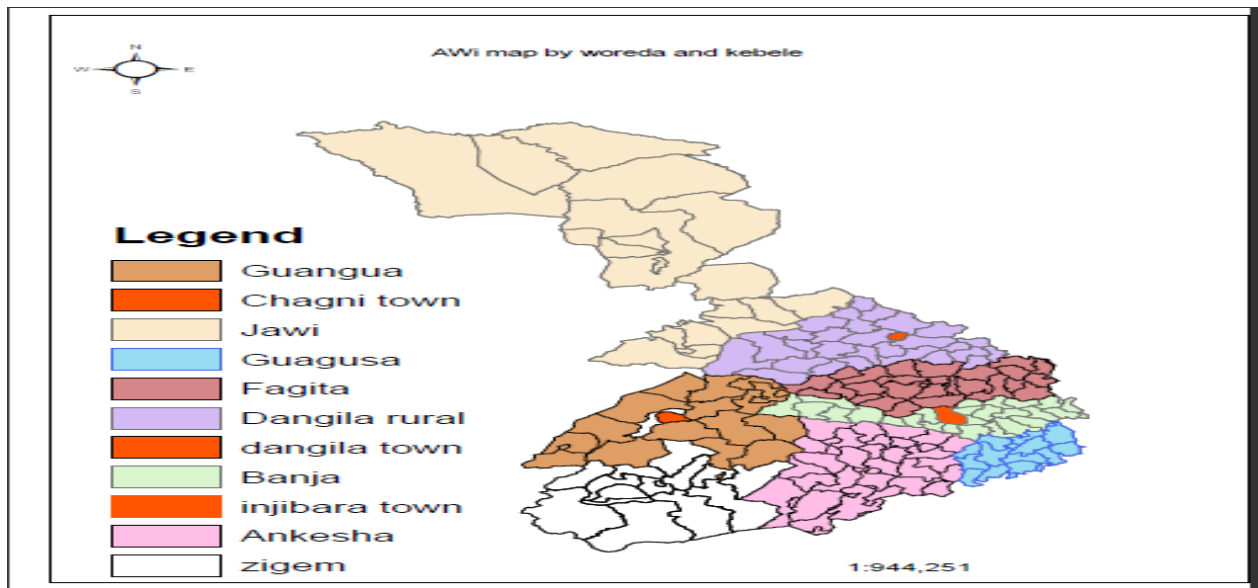


Figure 2: Map of Study area, Awi zone, ANRS, Northwest Ethiopia, 2020

## 5.2. Study design

A community based cross sectional study was conducted from 1 September to 1 October, 2021.

## 5.3. Population

### 5.3.1. Source population

The source population was all adults (18 years and above) in Awi zone.

### 5.3.2. Study population

All adults residing in randomly selected three districts.

## 5.4. Eligibility Criteria

### 5.4.1. Inclusion Criteria

Adults (18 years and above) who live for a minimum of six month in Awi zone

### 5.4.2. Exclusion Criteria

Seriously ill or could not respond due to physical disabilities (e.g., deaf and dumb) was excluded. People who are not permanent residents to the area was excluded

## 5.5. Sample size determination and sampling procedure

Sample size was determined using a single population proportion formula, by taking 95% confidence interval, 5% margin of error, 19.1% proportion of vaccine hesitancy from a study conducted in Addis Abeba and adding up 10% non-response rate(18).

$$\begin{aligned} N &= Z_{\alpha/2}^2 (p)(1-p) / \alpha^2 \\ &= (1.96)^2 - (0.191)(1-0.191) / 0.05^2 \\ &= 238 \end{aligned}$$

So the sample size was 238. Considering a design effect of 1.5 and non-response rate of 10%, the final sample size was 393.

### 5.5.1 Sampling procedure

Multistage sampling method was used. Among the thirteen Districts of the zone three was selected using simple random sampling technique. The Districts that selected was then stratified into urban and rural 'kebeles' and from each stratum one 'kebele' was selected using simple random sampling technique. The calculated sample size was used to recruit participants that reside in the respective 'kebeles' (see Figure 3). Systematic random sampling was used to select participant households and from the households if multiple illegible participants found was chosen with simple random sampling.

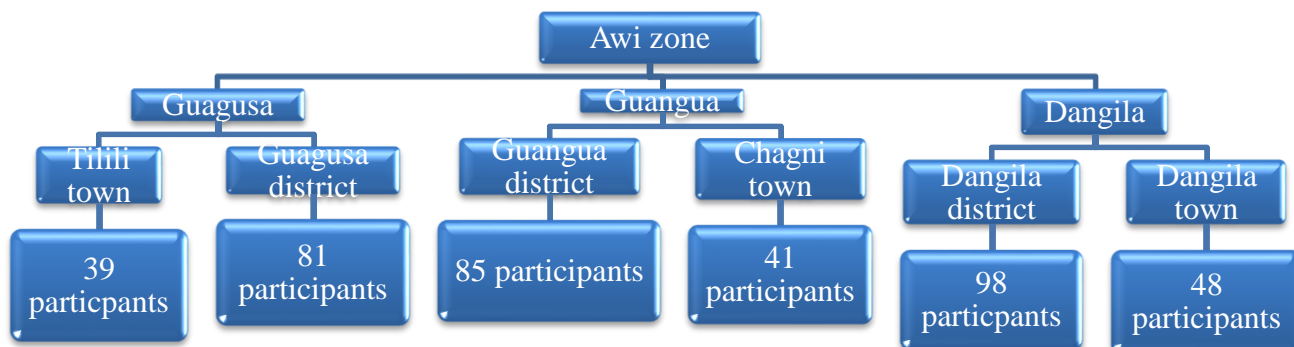


Figure 3: Schematic presentation of the sampling procedure in Covid 19 vaccine hesitancy in Awi zone, Northwest Ethiopia.

## 5.6. Principal research instruments

A structured questionnaire used; it was prepared in English, translated into Amharic and then translated back into English to check for consistency. The questionnaire documented general socio-demographic variables; risk perception variables, information source and variables that address the willingness level of receiving Covid 19 vaccines.

## 5.7. Variables of the study

**Dependent variables:** The primary outcome variable of the study was COVID-19 vaccine hesitancy which was assessed by asking a question “Are you willing to get Covid 19 vaccine?” was asked then the response was dichotomized as “Yes” or “No”.

**Independent variable:** Independent predictor variables included socio-demographics such as age, gender, residence, level of education, and employment status. Other predictors included job type), having had a diagnosis of COVID-19 (with no symptoms, mild or severe symptoms), clinical risk of severe consequences from COVID-19, risk perception of contracting the disease or infecting others, and past experience with discrimination.



## 5.8. Data collection

For administering the structured questionnaire, eight interviewers were used. All interviewers have completed secondary school and speak Amharic. All of them had previous experience of health related data collection. Refreshment training was given for half day on the purpose of the study, confidentiality of information, informed verbal consent and techniques of interview. Three Supervisors who have first degree in health fields was supervising the work of data collectors. The supervisors closely monitored all field work along with the principal investigator. All the questionnaires were retrieved from the tablets to a laptop each night. Any entry with missing or inconsistent data was returned back to the respective data collector for re-interview. Data was collected during the weekdays from 1-15september, 2021.

## 5.9. Data analysis

The variables of the quantitative data was exported to Ms Excel 2013 using ODK brief case V 1.16.1 then the Ms Excel document was exported to SPSS V.23 for windows for more analysis. Errors related to inconsistency of data was checked and corrected during data cleaning. Multivariate logistic regression analyses were performed to compute the adjusted odds ratio (aOR) with a 95% confidence interval. Vaccine hesitancy was the dependent variable and was dichotomized Yes or NO for getting vaccinated with Covid 19 vaccine. Socio-demographic characteristics, individual risks and perceptions, contextual factors, and vaccine-specific issues were included as predictor variables for vaccine hesitancy. Predictor variables were included in the multivariate model if found to be significant at a 0.25 significance level in the crude logistic regression. Multicollinearity of the variables was assessed using variance inflation factors and the Hosmer-Lemeshow goodness-of-fit test was used to ensure that the model adequately fit the data. The significance level was set at <0.05 SPSS version 23 was used for the data analyses. Summary tables and charts used for describing data.

## **5.10 Ethical consideration**

Ethical clearance for the research was obtained from research ethical review board of Bahir Dar University. The head of Awi Zone Health Department, and selected Health Office and head of the health Center was informed about the purpose of the study. Awi zone Health Desk to permit us to undertake the research. The regional and zonal health offices, after consenting, delivered a letter to the zonal administration, and to the selected District and 'kebele' administrations. Informed verbal consent was obtained from all study subjects before conducting the actual study. For this purpose a consent form was prepared to each participant, which explains about the purpose of the study, confidentiality, and the respondent's full right to take part or not to take part in the study. Each interview was conducted after informed verbal consent secured.

## **5.11 Dissemination and utilization of the result**

The result of the study will be disseminated to Bahir Dar University, Amhara Regional Health Bureau, Awi ZHD, Study sites and other concerned and interested organizations. It will be also presented in various seminars, workshops and published in a scientific journal.

# **6. Result**

## **6.1 Scio-demographic characteristics**

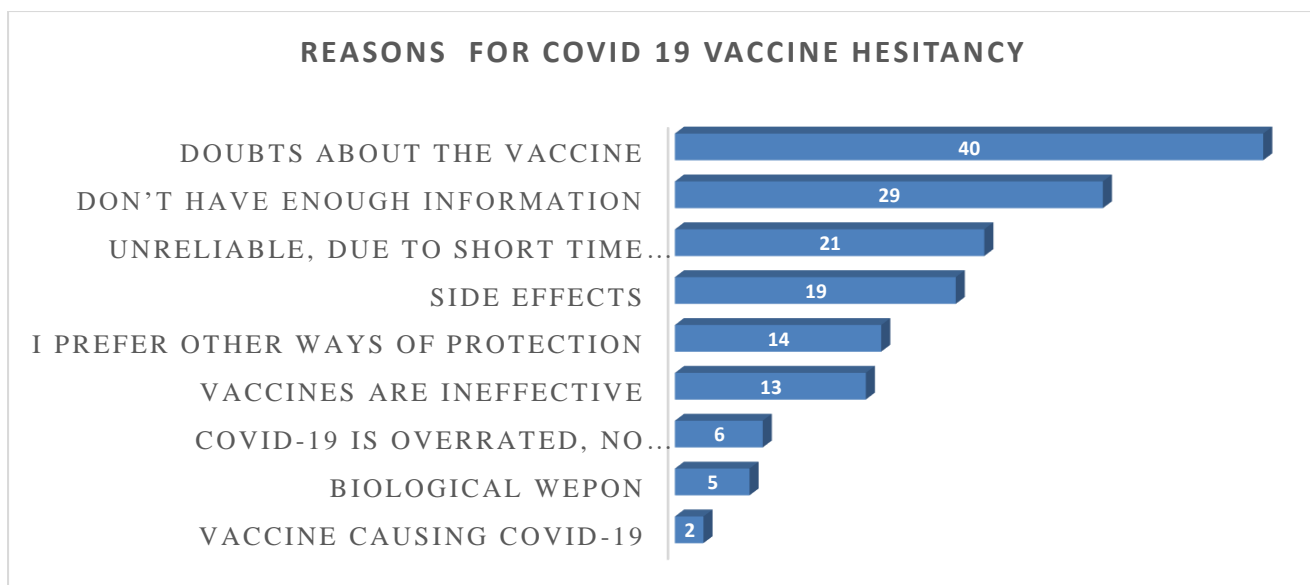
A total of 393 respondents participated in the study. Majority of the participants 231 (58.8%) were males and have income less than 3000 birr per month which is less than 2 USD per day at the exchange rate of 1\$:50 Ethiopian birr taken at the time of data collection (76.6%). The mean age of the participants was 34.29 years ( $\pm 12.578$ ), ranging from 19 - 80 years. Further characteristics can be found in the below table (Table 1)

**Table 1 Socio-demographic characteristics of participants for the study Covid 19 vaccine hesitancy and its associated factors in Awi zone, North West Ethiopia, 2021 (n= 393)**

Socio demographic variables		Frequency (N)	Percent (%)
Sex	Male	231	58.8
	Female	162	41.2
Age	18-30	174	44.3
	31-40	121	30.8
	41-50	55	14.0
	>51	43	10.9
Income in ETB	<3000	301	76.6
	3001-5999	67	17.0
	>6000	25	6.4
Marital status	Not Married	136	34.6
	Married	231	58.8
	Divorced	19	4.8
	Widowed	7	1.8
Education	No formal education	117	29.8
	Primary school	116	29.5
	Secondary school	62	15.8
	College and above	98	24.9
Religion	Christian	367	93.4
	Muslim	26	6.6
Residence	Urban	128	32.6
	Rural	265	67.4

## 6.2 Covid 19 Vaccine hesitancy and its reason

Out of the 393 people who took part in the survey, less than half 149 (37.9%) said they would not accept COVID-19 vaccines, and more than half (62.1%) said they would. Of the 149 participants who were unwilling to accept the COVID-19 vaccines, 40 (26.8%) and 29 (19.5%) were doubtful about the vaccines and don't have enough information of the vaccine respectively.



Picture 1: Reason for refusing to take Covid 19 vaccine in Awi zone, Northwest Ethiopia, 2021

### 6.3 Factors Associated with Acceptance of COVID-19 Vaccine

Sex, residence, information source and belief about safety and effectiveness of vaccines all found to be significantly correlated with acceptance of the COVID-19 vaccines in a multivariable logistic regression. COVID-19 vaccines were more likely to be rejected by males than females (aOR= 1.73, 95% CI: 1.03, 2.91). Another factor linked to COVID-19 vaccine hesitancy was one's residential place. Those who reside in rural areas are three times more likely to be hesitant of accepting the COVID-19 vaccine than these who live in urban areas (aOR=2.80, 95% CI: 1.53, 5.12). Respondents who had their information from mass media and social media regarding Covid 19 vaccines are more likely to be hesitant to accept the Covid 19 vaccine than these who rely on information from Health professionals with adjusted odds ratio of (aOR=5.44, 95% CI: 1.81, 16.31) (aOR=8.70, 95% CI: 2.64, 28.59) respectively. Participants who don't believe on safety of Covid 19 Vaccines are more hesitant on accepting Covid 19 vaccines (aOR=1.44, 95% CI: 1.78, 2.64) than these who agree vaccines in general are safe. Concern about effectiveness Covid 19 vaccine was also found to be associated with the hesitancy level as these who doesn't believe in effectiveness of Covid 19 shows higher hesitancy (aOR=6.40, 95% CI: 3.43, 11.95). Among participants 40 (10.1%) oppose vaccination altogether.

**Table 2 Bivariate and multivariate logistic regression analysis of factors associated with COVID-19 vaccine hesitancy, in Awi zone, Northwest Ethiopia, 2021**

Variables		Vaccine hesitancy		COR (95% CI)	aOR (95% CI)	p-value
		Yes (%)	No (%)			
Sex	Male	127(55.5%)	104(45.0%)	2.13(1.38-3.27)	1.73 (1.03, 2.91)	0.038
	Female	117(72.2%)	45(27.8%)			
Residence	Urban	104(81.3%)	24(18.8%)	3.89(2.33,6.41)	2.80(1.53,5.12)	0.001
	Rural	140(52.8%)	125(47.2%)			
Where do you get your information on the COVID-19 vaccine?	Health professionals	41(78.8%)	11(21.2%)	2.305(1.44,11.57)	8.70(2.64, 28.59)	0.002
	Mass media	124(64.6%)	68(35.4%)			
	Social media	27(39.1%)	42(60.9%)			
	Others	52(65.0%)	28(35.0%)			
Do you believe Covid 19 vaccines are safe?	Yes	164(85.5%)	28(14.6%)	4.28(2.75,6.65)	1.44(1.78, 2.64)	0.000
	No	80(39.8%)	121(60.2%)			
Do you believe Covid 19 vaccines are effective?	Yes	196(81.0%)	46(19.0%)	9.14(5.71,14.62)	6.40(3.43, 11.95)	0.001
	No	48(31.8%)	103(68.2%)			

## 7. Discussion

As COVID-19 continues to ravage the world, vaccination offers the most reliable hope for a permanent solution to controlling the pandemic. However, a vaccine must be accepted and used by a large majority of the population to create herd immunity(53). The findings of this study showed that 37.8% (n=149) participants are not willing to receive COVID-19 vaccine, which is higher than previous studies in Ethiopia like African CDC study in February, 2021 which reports only 4% of hesitancy followed by a March, 2021 study in Addis Abeba which found 19.1% of participants to hesitate on taking Covid 19 vaccine jab but it is lower than the 53.9% hesitancy level reported in Wolita Sodo town (17, 18, 19, 74). When we compare the findings reported from other countries such as Kuwait (76.4%), Jordan (71.6%), Italy (46.3%), Russia (45.1%), Poland (43.7%), US (43.1%), and France (41.1%) the reported hesitancy level is low (1-6). On the other hand it is significantly higher than studies in countries like Ecuador (3.0%), Malaysia (3.7 %), Indonesia (6.7%) and China (8.7%) which report the least hesitancy rates in the world(7, 22, 40, 57, 58). The probable reason for the discrepancy between the current result and other studies may be due to socio- demographic, socio-economic and mainly time differences in which many conspiracy theories take helm. The discrepancies might also be due to insufficient knowledge about the vaccine and difference in the perception of the seriousness of the pandemic. This implies that if the doubts and fears of the majority regarding the vaccine are not addressed properly, we may not be able to attain herd immunity.

An interesting finding of this study that needs further examination is sex-based differences. In the final regression model, females (27.6% hesitancy rate) are more willing to take COVID-19 vaccination than males, which showed males (45% hesitancy rate) are more vaccine-hesitant than their counterparts. In contrast, a study in Addis Abeba found females to be 1.97 times more hesitant of taking Covid-19vaccine. the global study by Lazarus and colleagues and an Israeli study found that males were more likely to accept the COVID-19 vaccine (53, 70). This might be due to males' high exposure to disinformation in different social events and outside home. In patriarchal society like Ethiopia this might be hugely significant as they will have direct and indirect effect in family members' decision making towards vaccines.

Vaccine hesitancy in rural areas is a major barrier that public health practitioners, health care providers, and local partners need to address to achieve vaccination equity. Our study find among rural resident participants 47.2% are hesitant to take Covid 19 vaccine compared with

18.8% hesitancy level in Urban areas which is in line with a study in US by the Kaiser Family Foundation that found vaccine hesitancy was highest in rural communities, with 21% of rural residents stating that they would “definitely not” get a vaccine compared with 10% of urban residents (22, 24, 25)

This study shows 58% hesitancy rate among those who use social media as source of information about Covid 19 vaccine which is higher in comparison with those who use Health professionals (11.6%) and Mass media (37.8%) as information source. This conforms to study in Addis Abeba and is in line with three studies in UK which found a negative relationship between COVID-19 conspiracy beliefs and COVID-19 health-protective behaviours, and a positive relationship between COVID-19 conspiracy beliefs and use of social media as a source of information about COVID-19 vaccines (18, 21, 49, 67).

Consistent with other studies, those who had concerns over COVID-19 vaccines’ safety and effectiveness were more likely to be vaccine hesitant (28, 53, 64, 71). This highlights the prevailing environment where there is heightened concern about the effectiveness and side effects of COVID-19 vaccines. Findings of this study emphasize the importance of a holistic, dynamic, transparent, and consistent public health messaging in improving vaccine hesitancy. Attention should be placed on building trust in the vaccine (72, 73). Additionally, reassurance of the capabilities of the regulatory bodies in ensuring safety and effectiveness should be emphasized (53). This should be accompanied by open access, real time safety data at a national and regional level, and risk-based assessments that inform decision making.

## **8. Strength and Limitation of the study**

This study has several strengths. The survey utilized the SAGE Working Group's standard questionnaire questions on assessing vaccine hesitancy, and collected the data electronically which gives better data quality.

However, the study might be limited due to the recall bias and social desirability bias during the data collection. Also Recognizing the other dimensions of access such as the availability of COVID-19 vaccines ensured through procurement and supply-side factors, and the affordability of the vaccines need to be considered over and above vaccine hesitancy as we aim to achieve herd-immunity, and the control of the pandemic. The study was cross-sectional and reflects the level and determinants of vaccine hesitancy, as of October 2021. Conducting a longitudinal study would have provided more information on the change in vaccine hesitancy and its drivers, which could also inform the tailoring of messages over time.

## **9. Conclusion and Recommendations**

In conclusion, this study identified growing trend of COVID-19 vaccines hesitancy, Males and resident in rural area reported higher rate of hesitancy which indicates the need for focused intervention in these areas with dynamic public health messaging. Vaccines perceived safety concerns and effectiveness were associated with this refusal. Hence, the health authorities via health care providers, who were identified by this study as the information source that is least associated to Covid 19 vaccine hesitancy, should design interventions in terms of awareness campaigns via all types of multimedia to spread more transparent information about the safety and efficacy of the vaccines.



## 10. References

1. Lone SA, Ahmad A. COVID-19 pandemic – an African perspective. *Emerging Microbes & Infections*. 2020;9(1):1300-8.
2. Fauci AS, Lane HC, Redfield RR. Covid-19 — Navigating the Uncharted. 2020;382(13):1268-9.
3. Habersaat KB, Betsch C, Danchin M, Sunstein CR, Böhm R, Falk A, et al. Ten considerations for effectively managing the COVID-19 transition. 2020;4(7):677-87.
4. Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Wallrauch C, et al. Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany. *N Engl J Med*. 2020;382(10):970-1.
5. Ranney ML, Griffeth V, Jha AK. Critical Supply Shortages — The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic. 2020;382(18):e41.
6. Hodgson SH, Mansatta K, Mallett G, Harris V, Emary KRW, Pollard AJ. What defines an efficacious COVID-19 vaccine? A review of the challenges assessing the clinical efficacy of vaccines against SARS-CoV-2. *The Lancet Infectious Diseases*. 2021;21(2):e26-e35.
7. Dubé E, Laberge C, Guay M, Bramadat P, Roy R, Bettinger J. Vaccine hesitancy: an overview. *Hum Vaccin Immunother*. 2013;9(8):1763-73.
8. Palamenghi L, Barello S, Boccia S, Graffigna G. Mistrust in biomedical research and vaccine hesitancy: the forefront challenge in the battle against COVID-19 in Italy. *European journal of epidemiology*. 2020;35(8):785-8.
9. MacDonald NE. Vaccine hesitancy: Definition, scope and determinants. *Vaccine*. 2015;33(34):4161-4.
10. Oliver JE, Wood T. Medical conspiracy theories and health behaviors in the United States. *JAMA internal medicine*. 2014;174(5):817-8.
11. Poland GA, Jacobson RM. The age-old struggle against the antivaccinationists. *N Engl J Med*. 2011;364(2):97-9.
12. Afolabi AA, Ilesanmi OS. Dealing with vaccine hesitancy in Africa: the prospective COVID-19 vaccine context. *Pan Afr Med J*. 2021;38:3-.
13. Larson HJ, De Figueiredo A, Xiahong Z, Schulz WS, Verger P, Johnston IG, et al. The state of vaccine confidence 2016: global insights through a 67-country survey. 2016;12:295-301.
14. Wagner AL, Masters NB, Domek GJ, Mathew JL, Sun X, Asturias EJ, et al. Comparisons of Vaccine Hesitancy across Five Low- and Middle-Income Countries. 2019;7(4):155.
15. Trust W. Wellcome Global Monitor: how does the world feel about science and health. 2019.
16. Sallam MJV. COVID-19 vaccine hesitancy worldwide: a concise systematic review of vaccine acceptance rates. 2021;9(2):160.
17. CDC A. COVI 19 Vaccine Perceptions: A 15-country study.
18. Dereje N, Tesfaye A, Tamene B, Alemshet D, Abe H, Tesfa N, et al. COVID-19 Vaccine hesitancy in Addis Ababa, Ethiopia: A mixed-methods study. 2021.
19. Gowda C, Dempsey AF. The rise (and fall?) of parental vaccine hesitancy. *Human Vaccines & Immunotherapeutics*. 2013;9(8):1755-62.
20. Kumar D, Chandra R, Mathur M, Samdariya S, Kapoor N. Vaccine hesitancy: understanding better to address better. *Israel Journal of Health Policy Research*. 2016;5(1):2.
21. Arede M, Bravo-Araya M, Bouchard É, Singh Gill G, Plajer V, Shehraj A, et al. Combating Vaccine Hesitancy: Teaching the Next Generation to Navigate Through the Post Truth Era. 2019;6(381).
22. Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: influence, impact and implications. *Expert review of vaccines*. 2015;14(1):99-117.
23. Matthew F. Daley M, Komal J. Narwaney M, PhD, Jo Ann Shoup P, Nicole M. Wagner M, Jason M. Glanz P. Addressing Parents' Vaccine Concerns: A Randomized Trial of a Social Media Intervention. *AJMP*. May 14, 2018.
24. Larson HJC, L.Z.; Eskola, J.; Katz, S.L.; Ratzan, S. Addressing the vaccine confidence gap. *lancet*. 2011;378, 526–535.

25. Salmon DA, Dudley MZ, Glanz JM, Omer SB. Vaccine Hesitancy: Causes, Consequences, and a Call to Action. *American journal of preventive medicine*. 2015;49(6 Suppl 4):S391-8.
26. Olson O, Berry C, Kumar N. Addressing Parental Vaccine Hesitancy towards Childhood Vaccines in the United States: A Systematic Literature Review of Communication Interventions and Strategies. *Vaccines*. 2020;8(4).
27. Browne M, Thomson P, Rockloff MJ, Pennycook GJPo. Going against the herd: psychological and cultural factors underlying the 'vaccination confidence gap'. 2015;10(9):e0132562.
28. Hornsey MJ, Harris EA, Fielding KSJHp. The psychological roots of anti-vaccination attitudes: A 24-nation investigation. 2018;37(4):307.
29. Murphy J, Vallières F, Bentall RP, Shevlin M, McBride O, Hartman TK, et al. Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. 2021;12(1):1-15.
30. Pomares TD, Buttenheim AM, Amin AB, Joyce CM, Porter RM, Bednarczyk RA, et al. Association of cognitive biases with human papillomavirus vaccine hesitancy: a cross-sectional study. 2020;16(5):1018-23.
31. Lin C, Tu P, Beitsch LMJV. Confidence and receptivity for COVID-19 vaccines: a rapid systematic review. 2021;9(1):16.
32. De Figueiredo A, Simas C, Karafillakis E, Paterson P, Larson HJJTL. Mapping global trends in vaccine confidence and investigating barriers to vaccine uptake: a large-scale retrospective temporal modelling study. 2020;396(10255):898-908.
33. Ekwebelem OC, Yunusa I, Onyeaka H, Ekwebelem NC, Nnorom-Dike OJPH. COVID-19 vaccine rollout: will it affect the rates of vaccine hesitancy in Africa? 2021.
34. Anderson RM, Vegvari C, Truscott J, Collyer BSJTL. Challenges in creating herd immunity to SARS-CoV-2 infection by mass vaccination. 2020;396(10263):1614-6.
35. Billah MA, Miah MM, Khan MN. Reproductive number of coronavirus: A systematic review and meta-analysis based on global level evidence. *PLoS One*. 2020;15(11):e0242128.
36. Phua J. Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations. *Lancet Respir. Med.* 8, 506–517 (2020).
37. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. Las implicaciones socioeconómicas de la pandemia de coronavirus (COVID-19): una revisión. 2020;78:185-93.
38. Zhou Z, Li X, Liu Z, Huang L, Yao Y, Li L, et al. A bromodomain-containing protein 4 (BRD4) inhibitor suppresses angiogenesis by regulating AP-1 expression. 2020;11:1043.
39. Organization WH. Ten threats to global health in 2019 Available at: <https://www.who.int/vietnam/news/feature-stories/detail/ten-threats-to-global-health-in-2019>. Accessed; 2019.
40. Dubé E, Gagnon D, MacDonald N, Bocquier A, Peretti-Watel P, Verger P. Underlying factors impacting vaccine hesitancy in high income countries: a review of qualitative studies. *Expert review of vaccines*. 2018;17(11):989-1004.
41. Larson HJ, Jarrett C, Eckersberger E, Smith DMD, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007–2012. *Vaccine*. 2014;32(19):2150-9.
42. Ogundele OA, Ogundele T, Beloved OJTNjogp. Vaccine hesitancy in Nigeria: Contributing factors—way forward. 2020;18(1):1.
43. Dubé E, MacDonald NE. How can a global pandemic affect vaccine hesitancy? *Expert review of vaccines*. 2020;19(10):899-901.
44. Harrison EA, Wu JWJJoe. Vaccine confidence in the time of COVID-19. 2020;35(4):325-30.
45. Weintraub RL, Subramanian L, Karlage A, Ahmad I, Rosenberg JJHA. COVID-19 Vaccine To Vaccination: Why Leaders Must Invest In Delivery Strategies Now: Analysis describe lessons learned from past pandemics and vaccine campaigns about the path to successful vaccine delivery for COVID-19. 2021;40(1):33-41.
46. The All-Party Parliamentary Group (APPG) on Vaccinations for All. The Next Decade of Vaccines: Addressing the Challenges

That Remain towards Achieving Vaccinations for All. Available online:.

47. Neergaard L, Fingerhut HJAPRS. AP-NORC poll: Half of Americans would get a COVID-19 vaccine. 2020;10:2020.
48. Almazeedi S, Al-Youha S, Jamal MH, Al-Haddad M, Al-Muhaini A, Al-Ghimlas F, et al. Characteristics, risk factors and outcomes among the first consecutive 1096 patients diagnosed with COVID-19 in Kuwait. 2020;24:100448.
49. El-Elimat T, AbuAlSamen MM, Almomani BA, Al-Sawalha NA, Alali FQJPo. Acceptance and attitudes toward COVID-19 vaccines: a cross-sectional study from Jordan. 2021;16(4):e0250555.
50. Harapan H, Wagner AL, Yufika A, Winardi W, Anwar S, Gan AK, et al. Acceptance of a COVID-19 vaccine in Southeast Asia: a cross-sectional study in Indonesia. 2020;8.
51. Wang J, Jing R, Lai X, Zhang H, Lyu Y, Knoll MD, et al. Acceptance of COVID-19 Vaccination during the COVID-19 Pandemic in China. 2020;8(3):482.
52. Wong LP, Alias H, Wong P-F, Lee HY, AbuBakar SJHv, immunotherapeutics. The use of the health belief model to assess predictors of intent to receive the COVID-19 vaccine and willingness to pay. 2020;16(9):2204-14.
53. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, et al. A global survey of potential acceptance of a COVID-19 vaccine. 2021;27(2):225-8.
54. Lin Y, Hu Z, Zhao Q, Alias H, Danaee M, Wong LPJpntd. Understanding COVID-19 vaccine demand and hesitancy: A nationwide online survey in China. 2020;14(12):e0008961.
55. Zhang KC, Fang Y, Cao H, Chen H, Hu T, Chen YQ, et al. Parental acceptability of COVID-19 vaccination for children under the age of 18 years: cross-sectional online survey. 2020;3(2):e24827.
56. Dodd RH, Cvejic E, Bonner C, Pickles K, McCaffery KJ, Ayre J, et al. Willingness to vaccinate against COVID-19 in Australia. 2021;21(3):318-9.
57. Rhodes A, Hoq M, Measey M-A, Danchin MJTLID. Intention to vaccinate against COVID-19 in Australia. 2021;21(5):e110.
58. Dinga JN, Sinda LK, Titanji VPJV. Assessment of vaccine hesitancy to a COVID-19 vaccine in Cameroonian adults and its global implication. 2021;9(2):175.
59. Dzinamarira T, Nachipo B, Phiri B, Musuka GJV. COVID-19 vaccine roll-out in South Africa and Zimbabwe: urgent need to address community preparedness, fears and hesitancy. 2021;9(3):250.
60. Jerving S. out of 5 Africans would take a COVID-19 vaccine: Africa CDC survey.
61. Reuben RC, Danladi MM, Saleh DA, Ejembi PEJjoch. Knowledge, attitudes and practices towards COVID-19: an epidemiological survey in North-Central Nigeria. 2021;46(3):457-70.
62. Al-Mohaithef M, Padhi BKJJomh. Determinants of COVID-19 vaccine acceptance in Saudi Arabia: a web-based national survey. 2020;13:1657.
63. Savoia E, Piltch-Loeb R, Goldberg B, Miller-Idriss C, Hughes B, Montrond A, et al. Predictors of COVID-19 Vaccine Hesitancy: Socio-Demographics, Co-Morbidity, and Past Experience of Racial Discrimination. 2021;9(7):767.
64. Almaghaslah D, Alsayari A, Kandasamy G, Vasudevan RJV. COVID-19 Vaccine Hesitancy among Young Adults in Saudi Arabia: A Cross-Sectional Web-Based Study. 2021;9(4):330.
65. Mnookin S. The panic virus: a true story of medicine, science, and fear: Simon and Schuster; 2011.
66. Smith A, Yarwood J, Salisbury DMJV. Tracking mothers' attitudes to MMR immunisation 1996–2006. 2007;25(20):3996-4002.
67. Allington D, Duffy B, Wessely S, Dhavan N, Rubin JJPm. Health-protective behaviour, social media usage and conspiracy belief during the COVID-19 public health emergency. 2020:1-7.
68. Abu Farha RK, Alzoubi KH, Khabour OF, Alfaqih MA. Exploring perception and hesitancy toward COVID-19 vaccine: A study from Jordan. Human Vaccines & Immunotherapeutics. 2021:1-6.
69. Harrison EA, Wu JW. Vaccine confidence in the time of COVID-19. European journal of epidemiology. 2020;35(4):325-30.
70. Malik AA, McFadden S, Elharake J, Omer SB. Determinants of COVID-19 vaccine acceptance in the US. EClinicalMedicine, 26, 100495. 2020.

71. Edwards A. *Front Earth Sci.* 2015;3(null):12.
72. Organization WH. Behavioural considerations for acceptance and uptake of COVID-19 vaccines: WHO technical advisory group on behavioural insights and sciences for health, meeting report, 15 October 2020. 2020.
73. Lawes-Wickwar S, Ghio D, Tang MY, Keyworth C, Stanescu S, Westbrook J, et al. A rapid systematic review of public responses to health messages encouraging vaccination against infectious diseases in a pandemic or epidemic. 2021;9(2):
- 74 Zewude B, Habtegiorgis T. Willingness to take COVID-19 vaccine among people most at risk of exposure in Southern Ethiopia. *Pragmatic and observational research.* 2021;12:37..

## 11. ANNEXES I ENGLISH VERSION

### I: Participant Information Sheet

Good morning/ good afternoon?

My name is \_\_\_\_\_. Currently, I am a graduate student at Bahir Dar University, College of Medicine and Health Sciences, School of public health, Department of general public health. And now I am conducting a research on assessing Covid 19 vaccine hesitancy level in Awi Zone

**Title of the research:** Covid 19 vaccine hesitancy in Awi Zone, Northwest Ethiopia, 2021

**Objective:** To determine level of vaccine hesitancy and in Awi zone, Northwest Ethiopia.

**Participants:** Randomly selected adults in Awi Zone districts

**Potential Risks:** There is no foreseen risk by being participating in this study.

**Benefits:** No financial benefits are related to this study. But by participating in this study, you will acquire or increase knowledge related to the Covid 19 vaccines. I would like to ask you a few questions. Your honest response to the questions can make the study to achieve its objective. All the information that you give was kept confidential and private. Only the principal investigator and interviewer will have access to the information. You are kindly requested to respond voluntarily. You can also choose not to participate in this study or if you become uncomfortable during the study, you was allowed to leave the study at any time. At any time if you have questions, you can contact me by using the following addresses.

**Abdulkadir Ahimed Mobile: 0918019239**

**Email: [abduahm28@gmail.com](mailto:abduahm28@gmail.com)**

## II: Informed consent

Bahir dar University, College of Medicine and Health Sciences, School of public health,  
Department of general public health. I here with declare that:

- The objective of this study is explained to me and is clear.
- The contents of the consent are verified to me to participate in the study. I understand that participation in this study is completely voluntary and that I may withdraw at any time without supplying reasons. I agree to participate in this study to be interviewed, provided my privacy is guaranteed. When signing this consent form to participate in the study, I promise to answer honestly to all reasonable questions and not provide any false information or in any other way purposely mislead the researcher.

Signature of the participant \_\_\_\_\_ date \_\_\_\_\_

Signature of the investigator \_\_\_\_\_ date \_\_\_\_\_

### III: Quantitative Interview questionnaires (English version)

The questionnaires are adapted from similar researches that were done previously, WHO SAGE e and CDC guidelines.

Section 1 Socio demographic characteristics				
R.N	Variables	Categories	Skip	Code
008	Participant ID	-----		SD01
009	Age	-----		SD02
010	Marital status	A. Never Married B. Married C. Divorced D. Widowed		SD03
011	Sex	A. Male B. Female		SD04
012	Education	A. No formal education B. Primary school C. Secondary and above		SD05
013	Monthly income	-----		SD06
014	Occupation	A. Paid work B. Private work (shopkeeper, own business, etc) C. Private work (farming) D. Housewife (work in the home and child care) E. Study		SD07

		F. Unemployed G. Other (specify)		
015	Religion	A. Christian B. Muslim C. Other (specify)		SD08
016	Residence	A. Urban B. Rural		SD09

Section 2: Covid 19 vaccine perception and information source				
2001	Do you have information about the presence of the COVID-19 vaccine?	A. Yes B. No		PIS01
2002	Where do you get your information on the COVID-19 vaccine?	A. Health professionals B. Mass media C. Social media D. Other (specify)		PIS02
2003	Did you see or hear any information about COVID-19 vaccines (e.g., on the news, on social media, or from friends and family) that you could not determine were true or false?	A. Yes B. No		PIS03
2004	How do you feel about the amount of information on	A. I'm not getting enough information.		



	COVID-19 vaccines that you are getting?	B. I'm getting enough information. C. I'm getting too much information		PIS04
2005	Do you believe vaccines in general are safe?	A. Strongly disagree B. Somewhat disagree C. Neutral D. Somewhat agree E. Strongly agree		PIS05
2006	Do you believe vaccines in general are effective?	A. Strongly disagree B. Somewhat disagree C. Neutral D. Somewhat agree E. Strongly agree		PIS06
2007	Do you believe Covid 19 vaccines are safe?	A. Yes B. No		PIS07
2008	Do you believe Covid 19 vaccines are effective?	A. Yes B. No		PIS08

Section 3: Individual influences, risks, and perceptions				
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3001	To your knowledge, do you have or have you had	A. Yes	If No skip to	
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	COVID-19?	B. No	3003	IRP01
3002	IF “Yes,” describe the level of care you received, or are receiving	A. Did not seek medical care B. Received medical care but C. was not hospitalized D. Was hospitalized		IRP02
3003	Do you know someone personally that has/had COVID-19?	A. Yes B. No		IRP03
3004	Do you personally know anyone in your family, group of friends, or community networks who became Seriously ill or died as a result of COVID-19?	A. Yes B. No		IRP04
3005	How concerned are you about getting COVID-19?	A. Not at all concerned B. A little concerned C. Moderately concerned D. Very concerned		IRP05
3006	Did you have history of chronic disease? (DM, Hypertension, Cardiac illness, Asthma, kidney diseases etc...)	A. Yes B. No		IRP06
3007	Did you believe COVID-19 vaccines are essential for us?	A. Yes B. No		IRP07
3008	Do you oppose vaccination	A. Yes		IRP08

	altogether?	B. No		
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Section 4: Covid 19 vaccine willingness				
4001	Are you willing to get Covid 19 vaccine?	A. Yes B. No	If No skip to	CVW01
4001	If No what is your reason?	A.COVID-19 is overrated, no vaccine is needed B. Vaccines are Ineffective C. Vaccine causing COVID-19 D. I prefer other ways of protection E. Don't have enough information F. Unreliable, due to short time for development G. Doubts about the vaccine H. Biological weapon I. Side effects J. Other ( specify)		CVW02

## ANNEXES II Amharic VERSION

### የተሳታፊዎች መረጃ መስጫ ቅጽ-በአማርኛ

እንደምን አደሩ/ዋሉ? አብዱልቃድር አህመድ እባላለሁ። በባህርዲር ዩኒቨርሲቲ ጤና ሳይንስ ኮላጅ፣ የህብረተሰብ ጤና ትምህርት ክፍል በአጠቃላይ የህብረተሰብ ጤና የ2ኛ ዓመት የማስትሬት ዴግሪ ተመራቂ ተማሪ ነኝ። በአሁኑ ሰዓት በአዊ ዞን በሚገኙ ወረዳዎች የኮቪድ 19 ክትባት ለመውሰድ ያለ የዝንባሌ ደረጃን በማጥናት ሊይ እገኛለሁ።

የጥናቱ ርዕስ፡- የኮቪድ 19 ክትባትን ያለመውሰድ ዝንባሌ በአዊ ዞን ሰሜን ምዕራብ ኢትዮጵያ 2013 ።

የጥናቱ ዓላማ፡- የኮቪድ 19 ክትባት ላለመውሰድ ያለ የዝንባሌ ደረጃን ማወቅ እንዲሁም ተጓዳኝ ሁኔታዎችን መለየት ተሳታፊዎች፡- ከ18 አመት በላይ የሆኑ ግለሰቦች ተሳታፊ ይሆናሉ።

የጎንዮሽ ጉዳት፡- በዚህ ጥናት መሳተፍ ምንም አይነት ጉዳት የለውም።

ጥቅማ ጥቅም፡- በዚህ ጥናት መሳተፍ ምንም አይነት ገንዘብ አያስገኝም። ስለዚህ የተወሰኑ ጥያቄዎችን ልጠይቅዎት እፈልጋለሁ። የእርስዎ በእውነት ላይ የተመሰረተ መልስ ለዚህ ጥናት መሳካት ጉልህ አስተዋፅኦ ያደርጋል። እርስዎ የሚሰጡት መረጃ ከጥናት አድራጊውና ቃለመጠይቅ አድራጊው በስተቀር በማንኛውም መልኩ ለሌላ 3ኛ ወገን ተላልፎ አይሰጥም። በሙሉ ፈቃደኝነት እንዲሳተፉ እየጠየቅሁ፣ ያለመሳተፍ ወይም በማንኛውም ጊዜ ራስዎን ከጥናቱ የማግለል ሙሉ ሙብት አለዎት። ማንኛውም ግሉጽ ያሌሆነ ጥያቄ ካለዎት በሚከተለው አዴራሻዬ ማግኘት ይችላሉ።

አብዱልቃድር አህመድ            ስ.ቁ:-0918019239

ኢ.ሜይል : [abduahm28@gmail.com](mailto:abduahm28@gmail.com)

## የስምምነት መግለጫ ፎርም - በአማርኛ

በባህርዲር ዩኒቨርሲቲ ጤና ሳይንስ ኮላጅ የህብረተሰብ ጤና ትምህርት ክፍል በአጠቃላይ የህብረተሰብ ጤና ዲፓርትመንት ድህረ ምረቃ ፕሮግራም እኔ ስሜ ከዚህ በታች የተገለፀው፤

- የዚህ ጥናት ዓላማ በደንብ የተብራራልኝ ሲሆን የጥናቱንም ዓላማ ተረድቻለሁ።
- በዚህ ጥናት ላይ መሳተፍ በሙሉ ፈቃደኝነት ላይ የተመሰረተ መሆኑን በሚገባ የተረዳሁ ሲሆን በማንኛውም ጊዜ ከጥናቱ ራሴን የማግለል መብት እንዳለኝ አውቅደለሁ። ስለሆነም የምሰጠው መረጃ እስከተጠበቀ ድረስ በዚህ ጥናት ለመሳተፍ ተስማምቻለሁ። በዚህ ጥናት ለመሳተፍ ስምምነቴን ስገልፅ ለምጠየቀው ጥያቄ በእውነት ላይ የተመሰረተ መልስ ለመስጠት የተስማማሁ መሆኔን አረጋግጣለሁ።

ስም-----

ፊርማ-----

ቀን-----

የጥናቱ ተሳታፊዎች በጥናቱ ለመሳተፍ ፈቃደኛ ከሆኑ መጠይቁን ይጀምሩ።

የጥናቱ ተሳታፊ ፈቃደኛ መሆናቸውን የሚያረጋግጥ የመረጃ ሰብሳቢው/አጥኚው

ስም-----

ፊርማ-----

ቀን-----

### መጠይቅ - አማርኛ ቅጽ

በባህርዲር ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና ትምህርት ክፍሉ በአጠቃላይ የህብረተሰብ ጤና ዱፓርትመንት ይህ መጠይቅ የተዘጋጀው የኮቪድ 19 ክትባት ላለመውሰድ ያለ የዝንባሌና ተዛማጅ ችግሮችን በተመለከተ መረጃ ለማሰባሰብ ነው።

Section 1 የግለሰብ አጠቃላይ ሁኔታ				
R.N	Variables	Categories	Skip	Code
8	የተሳታፊ መለያ ቁጥር	-----		SD01
9	እድሜ	-----		SD02
10	የትዳር ሁኔታ	A. ያላገባ		
		B. ያገባ		SD03
		C. በፍች የተለያየ		
		D. በጥቅ የተለያየ		
11	ፆታ	A. ወንድ		SD04
		B. ሴት		
12	የትምህርት ሁኔታ	A. መደበኛ ትምህርት ያልተከታተለ		
		B. የመጀመሪያ ደረጃ ትምህርት የተከታተለ		SD05
		C. ሁለተኛ ደረጃ ትምህርት የተከታተለ		
13	ወርሀዊ ገቢ በብር	-----		SD05
14	ሥራ	A. የግል ሰራተኛ		

		B. የመንግስት ሰራተኛ		
		C. የቤት እመቤት		
		D. ስራ ፈላጊ		SD06
15	ሀይማኖት	A. ክርስቲያን		SD07
		B. ሙስሊም		
		C. ሌላ ይገለጽ		
16	የመኖሪያ ቦታ	A. ከተማ		SD08
		B. ገጠር		
ክፍል 2: ስለ ኮቪድ 19 መከላከያ ክትባት ያለ መረጃ እና አመለካከት				
2001	የኮቪድ 19 መከላከያ ክትባት ስለመኖሩ መረጃው አለዎት?	A. አዎ		PIS01
		B. የለም		
2002	የኮቪድ 19 ክትባትን በተመለከተ መረጃ የሚያገኙት ከየት ነው?	A. ከመገናኛ ብዙሀን		PIS02
		B.		
		C. ከማህበራዊ ሚዲያ		
		D. ከጤና ባለሙያዎች		
		E. ከጋዜጦች		
		F. ሌላ (ይገለፅ)		
2003	የኮቪድ 19 ክትባትን በተመለከተ እውነት ወይም ውሸት መሆኑን ሊያረጋግጡት ያልቻሉትን መረጃ ከ ዜና፣ ማህበራዊ ሚዲያ፣ ከጓደኛ	A. አዎ		PIS03
		B. የለም		

	ወይም ቤተሰብ ሰምተው ይሆን?			
2004	የኮቪድ 19 ክትባትን በተመለከተ በሚያገኙት የመረጃ መጠን ላይ ምን ይሰመዎታል?	A. በቂ የሆነ መረጃ እያገኘሁ አይለም.		
		B. በቂ የሆነ መረጃ እያገኘሁ ነው.		PIS04
		C. ከበቂ በላይ የሆነ መረጃ እያገኘሁ ነው.		
2005	በአጠቃላይ ሲታይ ክትባቶች ይህንነታቸው የተጠበቀ እና አደጋ የማያስከትሉ ናቸው ብለው ይስማማሉ?	A. በጣም አልስማማም		
		B. በጥቂቱ አልስማማም		PIS05
		C. ገለልተኛ		
		D. በጥቂቱ እስማማለሁ		
		E. በጣም እስማማለሁ		
2006	በአጠቃላይ ሲታይ ክትባቶች ውጤታማ ናቸው ብለው ያስባሉ?	A. በጣም አልስማማም		
		B. በጥቂቱ አልስማማም		PIS06
		C. ገለልተኛ		
		D. በጥቂቱ እስማማለሁ		
		E. በጣም እስማማለሁ		
2007	የኮቪድ 19 ክትባቶች ይህንነታቸው የተጠበቀ እና አደጋ የማያስከትሉ ናቸው ብለው ይስማማሉ?	A. አዎ		
		B. የለም		PIS07



2008	የኮቪድ 19 ክትባቶች ውጤታማ ናቸው ብለው ያስባሉ?	A. አዎ		PIS08
		B. የለም		
ክፍል 3: ግለሰባዊ ተፅዕኖዎች፣ ስጋቶች እና ግንዛቤዎች				
3001	በእርሶ ግንዛቤ ከዚህ በፊትም ይሁን አሁን በኮቪድ 19 ተይዘው ነበር?	A. አዎ	መልሳቸው የለም ከሆነ ወደ ቁ 3003 ይለፍ	IRP01
		B. የለም		
3002	መልሰዎ አዎ ከሆነ ያገኙትን የህክምና አገልግሎት እንዴት ያዩታል?	A. ምንም አይነት ህክና አላገኘሁም		IRP02
		B. ህክምና ባገኝም ሆስፒታል አልጋ አልያዝኩም		
		C. ሆስፒታል አልጋ ይኼ ነበር		
3003	አርስዎ በአካል የሚያውቁት በኮቪድ 19 የተያዘ ሰው ነበር?	A. አዎ		IRP03
		B. የለም		
3004	የእርሶም የቤተሰብ አባል፣ ጓጉኛ ወይም የቅርብ ሰው በኮቪድ 19 በፅኑ የታመመ ወይም የሞተ ነበርን?	A. አዎ		IRP04
		B. የለም		
3005	ኮቪድ 19 ይይዘኛል ብለው ምን ያህል ይሰጋሉ?	A. ምንም ስጋት የለብኝም		IRP05
		B. በጥቂቱ አሰጋለሁ		

		C. ከፍ ያለ ስጋት አለብኝ		
		D. እጅግ በጣም እሰጋለሁ		
3006	ተላላፊ ያልሆኑ በሽታዎች አለባቸውን? (እንደ ስኳር, ግፊት, የልብ ህመም, አሰም ኩላሌት በሽታን የመሳሰሉት)	A. አዎ		IRP06
		B. የለም		
ክፍል 4: የኮቪድ 19 ክትባትን ለመውሰድ ያለ ዝግጁነት				
4001	የኮቪድ 19 ክትባት ለኛ ጠቃሚ ናቸው ብለው ያስባሉ?	A. አዎ		CVW01
		B. የለም		
4002	የኮቪድ 19 ክትባትን ለመውሰድ ፍቃደኛ ነዎት?	A. አዎ		CVW02
		B. የለም		
4003	መልስዎት የለም ከሆነ ምክንያቶች ምን ይሆን?	A. ኮቪድ 19 ከሚገባው በላይ የተጋነነ ሲሆን ክትባትም አያስፈልገውም		CVW03
		B. ክትባቶች ውጤታማ ናቸው ብዬ ስለማስብ		
		C. ክትባቶች ኮቪድ 19ን ስለሚያመጡ		
		D. ሌሎች ራስን የመጠበቂያ ዘዴዎች ስለምመርጥ		
		E. በቂ የሆነ መረጃ ስለሌለኝ		
		F. በአጭር ጊዜ የተዘጋጀ		

		ስለሆነ እምነት ስላጣሁ		
		G. በክትባቶች ላይ ጥርጣሬ ስላለኝ		
		H. ባዮሎጂካል የጦር መሳሪያ ስለሆነ		
		I. የጎንዮሽ ጉዳት ስለሚያሰጋኝ		
		J. ሌላ ካለ (ይገለፅ)		