Original Article

Impact of COVID -19 on population health and economic wellbeing in Ethiopia: A national pilot survey

Winini Belay[1], Tsegahun Manyazewal[1], Yimtubezinash Woldeamanuel[1,2], Eyasu Makonnen[1,3], Solomon Teferra[4], Adamu Addissie[5], Charlotte Hanlon[1,4,6], Tewodros Haile[7], Wondwossen Amogne[7], Damen Hailemariam[5], Azeb Asaminew[4], Kassahun Habtamu[8], Mesele Araya[9], Tigest Ajeme[1], Tigist Eshetu[1], Haileleuel Bisrat[1], Kehabtimer Shiferaw[5], Munir Kassa[10], Aschalew Abayneh[11], Fentie Ambaw[12], Yemane Berhane[13], Rahel Gebremariam[14], Gail Davey[15], Girmay Medhin[1,16], Abebaw Fekadu[1,4,15]

[1]Addis Ababa University, Centre for Innovative Drug Development and Therapeutic Trials
 for Africa (CDT- Africa), Addis Ababa, Ethiopia
[2]Addis Ababa University, College of Health Sciences, Department of Microbiology, Parasitology,
 Immunology and Pathology, Addis Ababa, Ethiopia
[3]Addis Ababa University, College of Health Sciences, Department of Pharmacology and Clinical Pharmacy,
 Addis Ababa, Ethiopia
[4]Addis Ababa University, WHO Collaborating Center for Mental Health Research and Capacity Building,
 Department of Psychiatry, College of Health sciences, Addis Ababa, Ethiopia
[5]Addis Ababa University, College of Health Sciences, School of Public Health, Addis Ababa, Ethiopia
[6]King's College London, Institute of Psychiatry, Psychology and Neuroscience, Centre for
 Global Mental Health, London, UK
[7]Addis Ababa University, College of Health Sciences, Department of Internal Medicine,
 Addis Ababa, Ethiopia
[8]Addis Ababa University, College of Education and Behavioral Studies, School of Psychology,
 Addis Ababa University, Addis Ababa, Ethiopia
[9]Addis Ababa University, Department of Economics, Addis Ababa, Ethiopia
[10]Ministry of Health-Ethiopia, Addis Ababa, Ethiopia
[11]Ethiopian Public Health Institute, Ministry of Health, Addis Ababa, Ethiopia
[12]Bahir Dar University, College of Medicine and Health Sciences, School of Public Health,
 Bahir Dar, Ethiopia
[13]Addis Continental Institute of Public Health, Addis Ababa, Ethiopia
[14]Voluntary Service Overseas (VSO), Ethiopia Country Office, Addis Ababa, Ethiopia
[15] Brighton and Sussex Medical School, Global Health and Infection Department, Brighton, UK
[16] Addis Ababa University, Aklilu Lemma Institute of Pathobiology, Addis Ababa, Ethiopia

Corresponding author*: gtmedhin@yahoo.com.

Abstract

Introduction: The COVD-19 pandemic has resulted in unprecedented global health and economic crisis, particularly in countries struggling with poverty. We conducted a national survey to understand the economic and health impacts of COVID-19 in Ethiopia.
Methods: A pilot, population-based, cross-sectional survey was conducted among adults randomly selected from the Ethio Telecom list of mobile phone numbers. Participants underwent a comprehensive phone interview about the impact of COVID-19 on their economic well-being and the health-related risks associated with COVID-19.
Results: Of 4,180 calls attempted, 1194 were answered, of which a successful interview was made with 614 participants. COVID-19 affected the family income of 343 [55.9%] participants, 56 [9.1%] lost their job, 105 [17.1%] perceived high stress in their household, and 7 [1.14%] reported death in their family in the past month. The odds of having a decreased income due to COVID-19 were 2.4 times higher among self-employed [adjusted odds ratio (AOR) 2.4, 95% CI (1.58-3.77)] and 2.8 times higher among unemployed [AOR 2.8, 95% CI (1.35-5.85)] participants. Two-hundred twenty-one [36%] participants had comorbidity in their household with hypertension, 72 [11.7%], diabetes,50 [8.1%], asthma, 48 [7.8%], and other chronic diseases, 51 [8.4%]. Forty-six [7.5%] participants had COVID-like symptoms in the previous month, where cough, headache, and fatigue were the most common.

Conclusion: *COVID-19 posed serious economic pressure on households. Self-employed and unemployed were the most affected. Continuous surveillance is needed to actively monitor the impact of COVID-19 in the community and safeguard the economic and health well-being of individuals and households.*

Introduction

The COVD-19 pandemic has resulted in unprecedented global health and economic crisis, particularly in countries struggling with poverty. It sparked the worst economic sinking and the strikingly high health crisis the world witnessed. The World Health Organization (WHO) declared its supreme alarm in early January 2020 while few countries understood the sense of urgency and took prompt actions (1). It was difficult for many countries to predict what the ultimate impact of the COVID-19 pandemic would be and what investments are needed to mitigate the disease earlier. In current times, while great efforts are underway to advance COVID-19 therapeutics, the continued importance of preventive measures is less credited (2).

COVID-19 was initially divided into four types: mild, moderate, severe, and critical cases (3). However, with the global outbreak of coronavirus, there was increasing evidence that many infections of COVID-19 were asymptomatic although transmissible but they can transmit the virus to others and in Africa, the first COVID-19 case was reported from Egypt on February 14 (4), 2020, and in Ethiopia, the first person with COVID-19 was reported in Addis Ababa on March 13, 2020 (5).

The COVD-19 pandemic has put many groups of people at substantially increased economic vulnerability. The impact of the pandemic has been particularly high among those with existing inequalities, as predicted (6, 7). The world economy is experiencing a historic and unprecedented shock due to the COVID-19 pandemic as the pandemic triggers several shocks simultaneously, including health, supply, demand and financial shocks (8). Efforts by governments to control the COVID-19 pandemic through partial and full business closures unavoidably leads to general decline in economic activities domestically and globally where this contraction in economic activities leads to economic recession (9). Few studies have been conducted to assess the income-related impact of COVID-19 in Ethiopia, to our knowledge, this study was one of the few to assess the impact of COVID-19 nationwide.

Therefore, this national survey aimed to understand the economic and health impacts of COVID-19 in Ethiopia.

Method

Study design and period

This study was a population-based cross-sectional study using telephonic survey. A telephonic survey was chosen as a data collection method considering the pandemic situation to cover a wider geographic area of the country, financial feasibility, and efficiency. This is a pilot study of a much larger cohort to be conducted over 12 months. The study was conducted from September to November 2021.

Participants and variables

Eligible participants were adults (age 18 and above) living in the country, speaking one or more of the three Ethiopian working languages (Amharic, Afan Oromo, and Tigrigna), and with no hearing or cognitive impairment or serious mental illness that impedes interview. The participants were randomly selected from the list of mobile phone numbers available in the country using computer-generated random numbers. Initially, 11 million numbers were computed, from which 30,000 phone numbers were randomly generated. The study reported here uses the first 4180 phone numbers from the 30,000 randomly generated numbers.

Covid-like symptoms were measured using a syndromal assessment as acute respiratory illness (fever and at least one sign/symptom of respiratory disease e.g. headache, cough, fatigue, sore throat, runny nose, shortness of breath, loss of smell and loss of taste). Household comorbidity was also measured as the presence of any diseases including hypertension, heart disease, asthma, tuberculosis, and diabetes mellitus. Mortality was measured as the occurrence of death in the past 4 weeks. The economic impact of COVID-19 was assessed by directly asking participants about the impact of COVID-19 on their economy as well as their households.

Data collection procedure and quality assurance

Data was collected through telephone (mobile phone) interviews. The questionnaire was implemented on an electronic data capture platform. Whenever the phone number is not working or not answered in the first attempt, repeated trials were made up to three times before excluding.

The data collectors took over the data collection work once all the contractual and training was finalized. Data collectors were trained on the instruments and about good ethical practices. The survey procedures and tools were pre-tested with 50 interviews for utility, feasibility, and acceptability, and amendments were made based on the results of the pretest.
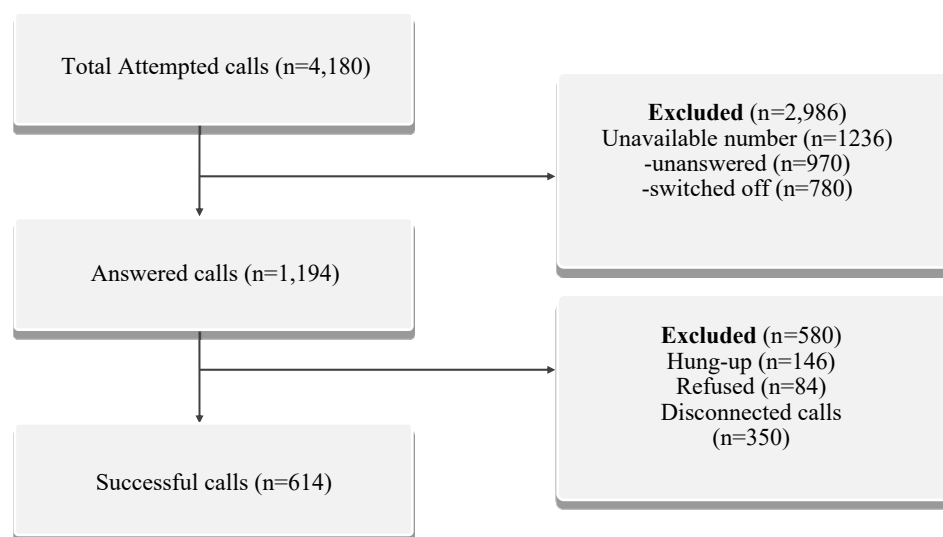
Statistical Analysis
Data was analysed using STATA 15.1. Descriptive statistics were conducted using frequency and proportions. Bivaraible and multivariable binary logistic regression analyses were computed to identify independent predictors of study participants' outcomes. Those variables which were screened using the results of the bi-variable analysis were entered into multivariable model to control the effect of confounders. Finally, the adjusted odds ratio (AOR) and 95% confidence interval (CI) were estimated, and the level of significance was considered at a *p-value < 0.05*.

Results
Among the 4,180 calls attempted, 1194 calls were answered. While 2986 calls were unavailable, unanswered, switched off, disconnected or hung up, we were only able to conduct a successful interview for 614 participants, yielding a response rate of 51.4%. (Figure 1).

Figure 1: Flow diagram of enrolment of the study participants

Baseline characteristics of the participants
Most of the participants (71.7%) were males. 39.1% of the participants aged 30-39 years, and 77.9% reside in the urban setting. More than one-thi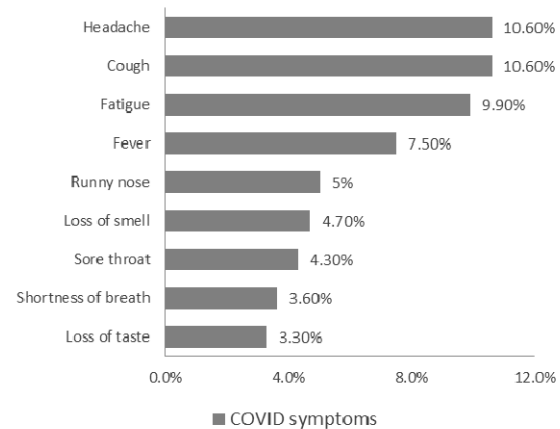rd of the participants (36.8%) were government employees, and 68.2% were married. 62.4% of participants stated that their current income didn't meet their needs whereas the majority (54.4%) of them reported that they reside in the average relative wealth subgroup (**Table 1**).

Table 1:- Socio-economic, demographic, and other baseline characteristics of the study participants (Total N=614)

Characteristics	Number	Percent
Sex		
Male	440	71.7
Female	174	28.3
Age in years		
18-29	207	33.7
30-39	213	34.7
40-49	118	19.2
50 and above	76	12.4
Marital Status		
Single	172	28.0
Married	419	68.2
Divorced/widowed	18	3.8
Level of Education		
Primary and below	55	9.0
Secondary	124	20.2
Certificate	148	24.1
College/University	287	46.7
Occupation		
Farmer	56	9.2
Self-employed	260	42.4
Government employee	178	28.9
Housewife/ Homemaker	30	4.9
Unemployed	45	7.3
Other	45	7.3
Residence		
Urban	478	77.9
Rural	136	22.1
Region		
Addis Ababa	222	36.1
Oromia	144	23.4
Amhara	139	22.6
SNNPR	66	10.7
Other	43	7.20
Relative Wealth		
Very low	53	8.60
Low	225	36.7
Average and above	336	54.7

COVID-19-like symptoms
Cough and headache were the most common symptoms which, accounts for 10.6% each among the study participants, while fatigue accounts for 9.9%, and 7.5% of the participants were found to have COVID-19-like symptoms (**Figure 2**), while most of the participants (92.5%) didn't have such symptoms.

Figure 2: COVID-like symptoms of study participants

Flu-like symptom and COVID-19 test
The majority (55.2%) of the participants were found to have flu-like symptoms in the past year. Of the total participants, 41.9% participants were tested for COVID-19 of whom 7.4% were positive. 15.8% of the participants thought that they had COVID-19, and from those, only 37.5% received treatment. Further, 48.4% of the participants' perceived that they were at risk for COVID-19 (**Table 2**).

Table 2: Flulike symptom, COVID-19 test, and treatment-related characteristics of the participants

Symptoms	Number	Percent
Flu-like symptom in the past year		
Yes	339	55.2
No	275	44.8
Tested for COVID-19, (n=614)		
Yes	257	41.9
No	357	58.1
Test Result (n=257)		
Positive	19	7.4
Negative	238	92.6
Think have COVID		
Yes	32	15.8
No	170	84.2
Receive Treatment (n=32)		
Yes	12	37.5
No	20	62.5

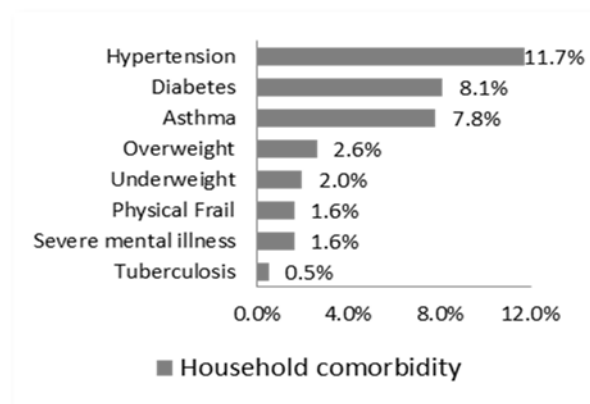**Economic impact of COVID-19**
The majority (55.9%) of the participants testified that their family income was affected by COVID-19 where 9.1% stated that their family members lost their job due to COVID-19. Among the total of 614 participants, only 7 (1.2%) of them reported death in the past month. Among the deceased, 4 of them were males (**Table 3**).

Table 3: - Impact of COVID-19 on the study participants

Symptoms	Number	Percent
Family income affected		
Yes	343	55.9
No	271	44.1
Family member lost a job		
Yes	56	9.10
No	558	90.9
Stress in the household		
Yes	105	17.1
No	509	82.9
Death in family (past month)		
Yes	7	1.10
No	607	98.9

Household Comorbidity
24.1% of the participants have one or more comorbidities. The leading comorbidity was hypertension (11.7%) followed by diabetes (8.1%) and Asthma (7.8%) (**Figure 3**)

Figure 3: Household comorbidity of study participant

Predictors of income loss due to COVID-19
Bivariable analysis identified age, region, residence, occupational status, gender, and educational status as candidate variables for the multivariable model. The result of multiple logistic regression models showed that occupation and region were significant predictors for COVID-19 related income loss. Compared to the government employed, the odds of having a decreased income due to COVID-19 was 2.4 times higher among

self-employed (AOR=2.4; 95% CI: 1.58, 3.77), 2.8 times higher among unemployed (AOR=2.8; 95% CI: 1.35, 5.85), and 2.08 times higher among other occupation (AOR=2.08; 95% CI: 1.04, 4.18). Compared to participants living in Oromia, the odds of having a decreased income due to COVID-19 was 1.59 higher among people living in Addis Ababa (AOR=1.59; 95% CI: 1.02, 2.50) (**Table 4**).

Discussion
COVID-19 affected the family income of 343 [55.9%] study participants, 56 [9.1%] lost their job, 105 [17.1%] perceived high stress in their household, and 7 [1.14%] reported death in their family in the past month. Two-hundred twenty-one [36%] participants had comorbidity in their household with hypertension, 72 [11.7%], diabetes, 50 [8.1%], asthma, 48 [7.8%], and other chronic diseases, 51 [8.4%]. Forty-six [7.5%] participants had COVID-like symptoms in the previous month, where cough, headache, and fatigue were the most common symptoms. Loss of smell and taste were reported by about half of those with COVID-19 like symptoms. Three-hundred thirty-nine [55.2%] had flu-like symptoms in the past year, and 257 [41.9%] had undergone the COVID-19 test, of whom 19 [7.4%] were positive. The findings indicate high levels of impact on family income related to COVID-19 with over half of study participants reporting loss of family income and about one in ten reporting loss of job. Additionally, over one in six had perceived high stress in their household, and 1% reported death in their family in the past month. The odds of having a decreased income due to COVID-19 was more than twice higher among self-employed and nearly three times higher among the unemployed individuals. Similar finding is reported from the UK where the self-employed were exceptionally impacted by the crisis (10). Similarly a study done in China and Germany supports our result where they reported Self-employed to be struck hard by income loss due to the pandemic (7, 11). Another study done in Germany found that employees that were continuously in short-term contracts, transitional furlough, and unemployed experienced a significant reduction in their household income (12).

In this study, the prevalence of income loss due to COVID-19 was 56%. This is in line with a world bank report from Ethiopia where they reported 55% of the participants income has reduced income due to COVID-19 (13).This finding was also comparable with a study conducted in China, where they found almost half (48%) of the respondents reported partial income loss (7). The concordance might partly be explained by similar proportion of government employees in both studies where job security is more assured. Confirming this assumption, a study from Japan has found that non-flexible workers

Table 4: Factors associated with Income loss due to COVID-19 among adult population of Ethiopia.

Characteristics	Income affected by COVID-19		COR (95% CI)	AOR (95% CI)
	Yes	No		
Age				
18-29	120(58)	87(42)	1	1
30-39	121(56.8)	92(43.2)	1.32(0.90, 1.95)	1. 38(0.90, 2.1)
40-49	62(52.5)	56(47.5)	1.15(0.73, 1.82)	1.02(0.67,1.81)
50 and above	36(47.4)	40(52.6)	0.88(0.52, 1.49)	0.87 (0.48, 1.54)
Region				
Oromia	80(55.6)	64(44.4)	1	1
Addis Ababa	115(52)	107(48.2)	1.61(1.05, 2.46)	1.59 (1.02, 2.50)*
Amhara	86(62)	53(38)	0.95(0.60, 1.52)	1.16 (0.71, 1.89)
SNNPR	33(50)	33(50)	1.44(0.81, 2.56)	0.97(0.84 ,2.88)
Others	25(58)	18(42)	1.68(0.83, 3.39)	1. 28(0.98, 4.26)
Occupation				
Government Employee	77((43.3)	101(56.7)	1	1
Farming and pastoralist	23(41.1)	33(58.9)	0.91(0.49, 1.68)	1.01(0.48, 2.14)
Self Employed	170(65.4)	90(34.6)	2.48(1.68, 3.67))	2.4(1.58, 3.77)**
Housewife	17(56.7)	13(43.3)	1.72(0.78, 3.74)	2.23(0.93, 5.3)
Unemployed	30(66.7)	15(33.3)	2.62(1.32, 5.21)	2.8(1.35, 5.85)*
Other	26(57.8)	19(42.2)	1.79(0.92, 3.48)	2.08(1.04, 4.18)*
Gender				
Male	253(57.5)	187(42.5)	1	1
Female	90(51.7)	84(48.3)	0.79(0.55, 1.12)	0.69(0.46,1.05)
Educational level				
Primary school and below	27(49.1)	28(50.9)	1	1
Secondary school	76(61.3)	48(38.7)	1.58(0.65, 3.80)	1.31(0.66, 2.57)
Certificate	86(58.1)	62(41.9)	1.38(0.58, 3.29)	0.95(0.37,2.44)
College/University	154(53.7)	133(46.3)	1.15(.50, 2.66)	0.94(0.37,2.42)
Residence				
Urban	278(58.2)	200(41.8)	1	1
Rural	65(47.8)	71(52.2)	0.65(0.44, 0.96)	0.76 (0.48,1.23)

* Statistically significant at p value of <0.05, ** statistically significant at p value of <0.01, other occupation includes students, pators, carpenters and some NGO workers.

non-flexible workers (manufacturing, transport, and construction) were hit harder by COVID-19 crisis than flexible workers as were contingent (non-regular) workers (14). People in lower economic classes in Ethiopia, those who were awaiting for aid, and under contractual working arrangements were also affected the most (9, 15, 16).

Although slightly higher, the number is also somewhat comparable with that of a study in the United States conducted over a slightly shorter duration (3 weeks), where they reported income loss due to COVID-19 of 43.4 % (17).

While we find higher rates of impact on the unemployed and the self-employed participants, a study in Pakistan has reported much higher rate among those working in the tourist industry, with 64% reporting income decre-

This economic impact at the individual level is also reflected at the national level with studies revealing a decline in economic growth in Africa of − 2.4 to − 5.1% and other health wellbeings during the outbreak of the COVID-19 pandemic (19, 20-24).

Over half of the participants had experienced flu-like symptoms in the previous year with nearly one in ten reporting COVID-19. This, combined with the relatively high burden of co-moribdities in households, which has the potential of complicating the course of COVID-19, means that the demand on the health system would be substantial. However, of participants who thought they had acquired COVID-19, only one-third were tested and had received treatment.

This low service utilization may partly explain why the health system was not overwhelmed as anticipated.

The impact was higher in Addis Ababa. This is to be anticipated as cities have been the epicenter of the pandemic (7). Our study was telephonic survey, which is subjected to non-response bias and there is a probability of decrease in accuracy of answers. Despite the telephonic survey nature of our study, we were able to collect data nationwide and that increased the representativeness of our study.

Conclusion

The COVID-19 pandemic is an unprecedented health and economic disaster with far-reaching and long-term consequences for individuals, families. Our study has confirmed this fact, with serious economic pressure on individual households, with self-employed and unemployed people most affected. Specific plans need to be designed to address the needs of those in unstable working situations. In future pandemics, such plans should be put in place in the early stages of the pandemic to prevent similar economic hardships. Moreover, the low capacity to conduct large scale diagnostic assessments impeds control of a pandemic. Our phone survey has demonstrated that it is possible to provide real time data on probable COVID-19. Therefore, larger scale rapid phone surveys may serve to augument the limited laboratory based survey. We suggest that continuous surveillance is needed to actively monitor the impact of COVID-19 in the community and safeguard the economic and health well-being of individuals and households.

Abbrevations

COVID-19: Coronavirus disease 2019
WHO: World Health Organization

Declarations

Ethics approval and consent to participate

The study was approved by the Institutional Review Board of the College of Health Sciences, Addis Ababa University with protocol number 086/20/CDT. Data collectors were trained in Good Clinical Practice and phone interviews were conducted after informed verbal consent was obtained. The data were kept confidentially and used for the purpose of the study only.

Consent for publication:

Not applicable

Availability of data and material

The datasets supporting the conclusions of this article are included within the article and its additional files. Any additional material can be obtained upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

AF, GM and TM conceived and designed the study. WB, TM, GM and AF performed the data analysis and interpretation of the findings. WB drafted the manuscript. All authors critically reviewed the manuscript and approved the final manuscript.

Supplementary Material

 None

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