Eximia Journal

(ISSN 2784-0735)

Vol. 9

2023

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

Income and Residence related Disparities of Information and Knowledge about COVID-19 and Behavioral response: Evidence from COVID-19 Community Risk Perception and Behavioral Response survey in Ethiopia

Dereje Y. Yada[1*], Mulugeta Gajaa[1], Ashinef Tedale[1], Girum Taye[1], Hiwot Achemyeleh[1], Fikreselassie Getachew[1], Tefera Taddele[1], Arega Zeru[1] and Senait Alemayehu[1]

[1]Ethiopian public health institute, health system, and reproductive Research directorate, Addis Ababa, Ethiopia

[*]Corresponding author, Email: derejeyohannis@gmail.com

Abstract. Introduction: The Coronavirus disease-19 (COVID-19) has caused enormous stress among the public in China initially and then after the whole world. This study aims to examine the income and residence-related disparities in information and knowledge about COVID-19 in Ethiopia. Methods: The data for this study was extracted from the community risk perception and behavioral response toward the COVID-19 survey data set. Out of 8005 survey participants, 7970 participants were used for the current study. Results of this study were presented by frequency, percent, concentration curve, tables and p-values used to indicate the significance level. Result: The concentration index of Knowledge of COVID-19 causes, COVID-19 transmission, COVID-19 symptoms, and its prevention across income status was (0.08, 0.02, 0.02, and 0.01), respectively. Indicating that participants of the highest income level had better knowledge than participants of the lowest income level. Similarly, the concentration index of information about COVID-19 from multimedia, print media, and social media across income status was (0.05, 0.37, and 0.07) respectively. The concentration index information about COVID-19 from health care professionals and community networks across residences was (-0.10) and (-0.07) respectively. Implying that participants of the rural resident had better access to information about COVID-19 from health care professionals and community networks than participants of the urban resident. Conclusion: COVID-19 causes, spread, symptoms, and prevention strategies were disproportionately more known to those with the highest income levels and those who lived in urban areas. Also, those with the highest income and those who live in urban areas have disproportionately more access to COVID-19 information from multimedia, print media, and social media than those with the lowest income level, and rural residents have disproportionately more access to COVID-19 information from health care professionals and community networks than urban residents.

Keywords. Covid-19, Knowledge, information, disparities, income, and residence

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

Introduction

Coronavirus disease 2019 (COVID-19) is not only cause of diseases outbreak but also affects the mental status of the population, including health workers(1). The Coronavirus disease-19 (COVID-19) has caused enormous stress among the public in China initially and then after the whole world (2,3). Health care workers' infection control measures are affected by their knowledge, attitude, practice and psychological responses towards COVID-19(1). This is raised due to fear of risk after the health care worker is infected. According to study conducted by Banda et al. (2021) on Knowledge, risk perceptions, and behaviors related to the COVID-19 pandemic in Malawi, approximately half of respondents perceived no risk or only limited risk that they would become infected with the novel coronavirus(4). However, in contrast to projections from epidemiological models, a high percentage of respondents expected to be severely ill if they became infected. Increased hand washing and avoiding crowds were the most frequently reported strategies used to prevent spreading COVID-19 (4). Some protective practices (e.g., face masks) were not widely adopted. Respondents in urban had a better understanding of disease trends and had adopted more protective actions than those in rural areas(4).

In response to the COVID-19 pandemic, almost all countries governments have encouraged, ordered citizens to practice social distancing, particularly by working, and established virtual studying and meeting platforms. Intuitively, only subsets of people have the ability to practice remote work(1,4–7). In the mass community, effective communication, accurate, and up-to-date information about COVID-19 prevention and control is critical, particularly for men, older age groups, and uneducated individuals (8). Both remote and in-person infrastructure has been changed and/or developed in order to acquire and use information from local populations(9). The focus on efficient communication also extends to measures to combat the spread of COVID-19 misinformation(9). Organizations are working to uncover any program bias resulting from preconceived views about what constitutes a suitable response plan, as well as to combat disinformation efficiently(9). However, in developing countries like sub-Saharan Africa and Asian countries living area, the infrastructures about flow of information from source matters their level of response and perception for this kind of pandemic(5,8–11). Several study conducted on rural-urban related knowledge shows that urban resident were more knowledgeable that rural and they have access for media to get information about COVID-19 prevention and response (12–21). In addition, COVID-19 information source was significantly determined by participant socio demographic characteristics, associated beliefs about the pandemic, and household living condition like income status (12,22,23,23–28). However, those previous studies don't show role of local information source and professionals in flow of information, awareness creation and raising community knowledge during the pandemic of COVID-19. Therefore, this study aims to examine income and residence related disparities of information and knowledge about COVID-19 and its behavioral response in Ethiopia.

Methods

Data source

Secondary data from community risk perception and behavioral response towards COVID-19 in Ethiopia survey was used. The survey was conducted at national level in all regions

except Tigray region. Tigray region was excluded due to uncertainty of security during data collection. The targeted respondents included all aged 18 years or older and living in the permanent residence at the time of data collection. Out of 8005 survey total respondents, 7970 study participants were used for the current study. Those who didn't heard anything about pandemic were excluded from this study analysis.

Study Variable

The dependent variables for this study were the scores of the knowledge and information related to COVID-19. Knowledge for this study was cascaded into knowledge about cause of COVID-19, knowledge about spread of COVID-19, knowledge about symptoms and prevention mechanism for COVID-19. Whereas source of information about COVID-19 was cascaded into different source such as multimedia, professional, community network, print media and social media information. Annual income status of household and residence was used to analyze disparities. So, there are nine dependent variables, four of them were knowledge related whereas five them were under information.

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

Table 1 Description and measurement of variables

Variable	Items and Measurement
Residence	Categorized as urban and rural
Income quintiles	Categorized into five quintiles using quintiles subdivision
Dependent	
Knowledge	**Items and measurement**
About COVID-19 cause	If the answer is "It's a virus that can cause a disease" for question "what is COVID-19?"=1, else 0
Spread of COVID-19	If the answer is at least one of "Droplets from infected people, Airborne, Direct contact with infected people, touching contaminated objects/surfaces, Contact with contaminated animals, Eating contaminated food and Drinking unclean water" for question "How does the COVID-19 spread?" =1, else=0
Symptoms	If the answer is at least one of "Fever/chills/rigor Cough/sneezing/ runny nose/congestion/sore throat, Shortness of breath and breathing difficulties/chest pain, Muscle pain and/or joint pain/ fatigue/general body weakness, Headache, GI symptoms(Diarrhea, vomiting and abdominal pain), Loss of smell and/or tasting" for question "What are the main symptoms" =1, else=0
Prevention mechanism	If the answer is at least one of "physical distancing, stay at home, wearing masks, Wash your hands regularly using soap and water, clean with sanitizer, Cover your mouth and nose when coughing or sneezing, Avoid close contact with anyone who has a fever and cough, Cook meat and eggs well, and Avoid direct contact with surfaces" for question "What preventive mechanisms do you know?"=1 else=0
Source of Information about COVID-19	
Multimedia	If the answer is at least one of "Radio and TV" for questions "Where did you hear about the new coronavirus from" =1 else= 0
Professional	If the answer is at least one of "Health care worker and Health extension worker" for questions "Where did you hear about the new coronavirus from" =1 else= 0
Community network	If the answer is at least one of "Family members, Friends, Volunteers, Community mobilisers, HDA, 'Edir', Youth and Women association and religious ceremony" for questions "Where did you hear about the new coronavirus from" =1 else= 0
Print media	If the answer is at least one of "Printed materials (Billboard, banners, Brochures, posters, newspaper, and magazine)" for questions "Where did you hear about the new coronavirus from" =1 else= 0

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

Social media	If the answer is at least one of “social media (Telegram/Whatsapp, Facebook, Website, etc.)” for questions “Where did you hear about the new coronavirus from” =1 else=0

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

Data Analyses

Secondary data was analyzed by using Stata version 16. Data was checked for error and completeness. Necessary assumptions were checked, and several analysis steps were performed. First, frequencies of individual variables of interest were calculated to understand their distribution. Second, to assess the inequality in residence and income, the slope index was calculated. This includes implication and estimation of inequalities using the concentration curve and the concentration index. The national weighted data was used for analysis.

The concentration curve is a visual approach that plots the cumulative percentage of a health variable on the vertical axis and the cumulative share of that variable in the population (from lowest to highest according to socioeconomic status indicators) on the horizontal axis. The concentration curve above (below) the equation line shows that the correct knowledge about COVID 19 is concentrated in the poor (rich people). The greater the concentration curve is from the equation line (that is, the 45-degree line), the greater the degree of inequality. The concentration index was calculated as twice the area between the concentration curve and the equality line to quantify the degree of socio-economic inequality in health or healthcare (26).

The concentration index can be negative, or positive or in between +1 and -1. In this analysis, a negative concentration index shows that knowledge is concentrated in people with relatively low-income status and rural resident, and a positive concentration index implies that, knowledge was concentrated in people with relatively high-income status and urban resident. A concentration index of zero means that there is no inequality in the knowledge of COVID 19. Beyond calculating the concentration index, we take a step towards understanding how each factor contributes to the socio-economic inequality observed in the knowledge of COVID 19 response.

3. Result

Percentage Distribution of Information Source by Income and Residence

Information about COVID-19 was distributed via multimedia such as TV and radio to nearly 3/4th of the community, and it scored well compared to other media. Its distribution shows, those who lived in urban areas and with good income status had access to get more information about COVID-19. According to the multimedia distribution among residence, most of respondent urban resident (92.4%) received information through multimedia such as radio and TV. Rural residents had more information on COVID-19 from health care professionals and community network (33.2% and 79.8%, respectively) than their counter parts. Printing media was the least modality (2%) regarding information about COVID-19 within the community. During the COVID-19 pandemic, the community network was 71.4% credible in reaching to vulnerable communities in relation to information (Table 2)

Table 2 Weighted distribution of information source by income and residence.

Source of information	National	Income level					Residence	
		Lowest	Low	Middle	High	Highest	Urban	Rural
Multimedia	78.2	66.1	77.1	78.2	85.3	86.0	92.4	68.5
Health professional	28.5	25.4	32.1	28.1	28.2	28.8	21.7	33.2
Community network	71.4	70.2	74.5	71.6	70.0	70.3	59.1	79.8
Print media	2.0	0.6	1.2	1.5	2.5	4.9	4.0	0.6
Social media	36.9	28.9	37.3	37.1	37.8	46.2	36.9	36.9

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

Percentage Distribution of COVID-19 knowledge by income and residence

About one-third of the respondents had no idea about cause of COVID-19 disease, although they were familiar with its transmission, symptoms, and prevention methods. According to the appropriate knowledge distribution about causes of COVID-19, respondents in the highest quintiles (72.5%) had proportionally more knowledge than those in the lowest quintiles (43.4%), and this was even higher in rural areas than in urban areas. Knowledge about COVID-19 transmission, symptoms, and prevention methods was lower in the lowest income quintiles (90.7%, 85.6%, and 91.0% respectively) compared to the highest income quintiles (98.0%, 96.2%, and 99.2% respectively) and higher in urban residents (97.8%, 96.0%, and 98.6% respectively) (Table 3).

Table 3 Weighted distribution of COVID-19 knowledge by income and residence

Knowledge	Total	Income level					Residence	
		Lowest	Low	Middle	High	Highest	Urban	Rural
Cause of COVID-19	69.5	43.4	64.1	67.3	66.1	72.5	43.4	64.1
Spread of COVID-19	96.8	90.7	94.3	96.6	98.3	98.0	97.8	93.9
Symptoms	94.1	85.6	88.0	93.4	94.7	96.2	96.0	88.1
Prevention mechanism	97.0	91.0	97.1	98.4	97.8	99.2	98.6	95.3

Inequalities of information source and knowledge

Table 4 shows the inequality of knowledge and information regarding COVID-19 as a function of income and residence. As a result, knowledge about cause of COVID-19 had a slope index inequality of income status of (0.29), knowledge about COVID-19 spread had a slope index inequality of (0.10), knowledge about COVID-19 symptoms had a slope index inequality of (0.14), and knowledge about COVID-19 prevention mechanism had a slope index inequality of (0.10). General knowledge about COVID-19 had a concentration index inequality of (0.08), knowledge about COVID-19 spread had a concentration index of (0.02), knowledge about COVID-19 symptoms had a concentration index of (0.02), and knowledge about COVID-19 prevention mechanism had a concentration index of (0.01)(Table 4 Income and residence related inequality of knowledge and information

In addition, the slope index income related inequality of information about COVID-19 from multimedia was (0.24), information about COVID-19 from print media was (0.05), and information about COVID-19 from social media was (0.17). Information from multimedia about COVID-19 had a concentration index income linked inequality of (0.05), information from print media had a concentration index income related inequality of (0.37), and information about cov-19 from social media had a concentration index income related inequality of (0.07). The slope index of residence-related inequalities in knowledge about causes COVID-19 was (0.29), information about COVID-19 spread was (0.10), for knowledge about symptoms (0.20), and for knowledge about prevention mechanisms (0.09). The concentration index of residence-related discrepancies of information about causes of COVID-19 was (0.05), knowledge about COVID-19 transmission and spread was (0.01), knowledge about COVID-19 symptoms was (0.02) and knowledge about COVID-19 prevention mechanism was (0.01).

According to the Slope index of residence related disparities of Information from Multimedia was (0.54), Information about COVID-19 from health care professionals was (-0.24), information about COVID-19 from community networks was (-0.39), and information about COVID-19 from print media was (0.08). According to the Concentration Index of residence

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

related disparities of Information from Multimedia was (0.07), health care professionals (-0.10), community networks was (-0.07), and print media was (0.41) (Table 4 Income and residence related inequality of knowledge and information. About one-third of the respondents had no idea about cause of COVID-19 disease, although they were familiar with its transmission, symptoms, and prevention methods. According to the appropriate knowledge distribution about causes of COVID-19, respondents in the highest quintiles (72.5%) had proportionally more knowledge than those in the lowest quintiles (43.4%), and this was even higher in rural areas than in urban areas. Knowledge about COVID-19 transmission, symptoms, and prevention methods was lower in the lowest income quintiles (90.7%, 85.6%, and 91.0% respectively) compared to the highest income quintiles (98.0%, 96.2%, and 99.2% respectively) and higher in urban residents (97.8%, 96.0%, and 98.6% respectively) (Table 3).

Table 3 Weighted distribution of COVID-19 knowledge by income and residence(Table 4).

Table 4 Income and residence related inequality of knowledge and information

Variables		Income level				Residence (1=rural, 2=urban)			
		SII	S. E	CIX	S. E	SII	S. E	CIX	S. E
Had Knowledge	About COVID-19	0.29*	0.03	0.08*	0.02	0.29*	0.03	0.05*	0.00
	Spread of COVID-19	0.10*	0.02	0.02*	0.00	0.10*	0.02	0.01*	0.00
	Symptoms	0.14*	0.02	0.02*	0.00	0.20*	0.03	0.02*	0.00
	Prevention mechanism	0.10*	0.02	0.01*	0.00	0.09*	0.02	0.01*	0.00
Source of information	Multimedia	0.24*	0.03	0.05*	0.01	0.54*	0.03	0.07*	0.00
	Professional	**0.01**	**0.03**	**0.01**	0.02	-0.24*	0.03	-0.10*	0.00
	Community network	**-0.02**	**0.03**	**0.00**	0.01	-0.39*	0.03	-0.07*	0.00
	Print media	0.05*	0.01	0.37*	0.09	0.08*	0.02	0.41*	0.00
	Social media	0.17*	0.03	0.07*	0.02	**0.00**	**0.03**	**0.00**	**0.00**

SII: slope index inequality; S.E: standard error; CIX: concentration index; *: significant at 5% significance level.

Concentration curve

In addition to slope index and concentration index, concentration curve visualizes the disparities of information and knowledge about COVID-19 among residence and income status. Cranberry color line of 45 degree indicates the line of equity and navy line the fitted line indicating disparities among income status and residence. As displayed below information from health care professionals and community network fitted above the equity line. Rural residents are more likely than urban residents to obtain information about COVID-19 from health care professionals and the community network. Those from top income quintiles are more likely than low-income quintiles to obtain information about COVID-19 from multimedia and had knowledge about COVID-19 pandemic (Figure 1).

Eximia Journal
Vol. 9, 64-75, May, 2023
ISSN: 2784-0735
www.eximiajournal.com

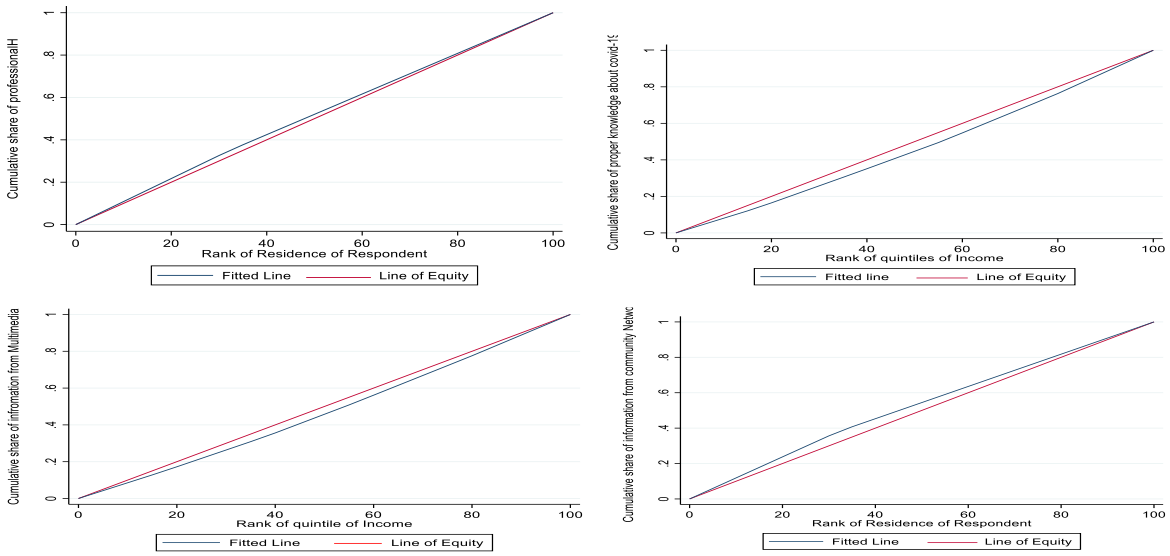

Figure 1 Concentration curve

Discussion

The COVID-19 Risk Perceptions and Behavioral Response nationwide survey data was used in this study. According to both the slope index inequality and the concentration index, there were disparities in knowledge of COVID-19, its spread, symptoms, and preventative mechanisms based on income status and residence. In comparison to those in the lowest income quintiles and rural residents, those in the highest income quintiles and urban residents had a higher proportion of knowledge about COVID-19, its spread, symptoms, and prevention mechanisms. According to the slope index, those from the highest income quintiles knew 29 % more about COVID-19 disease than those from the lowest income quintiles. Our finding in line with study conducted online survey among US adults in two rounds which reveals that COVID-19 information source and knowledge was significantly determined by participant socio demographic characteristics, associated beliefs about the pandemic, and household living condition like income status(12). And our finding similar to the study conducted in China on differences in knowledge about preventive mechanism of COVID-19 between urban and rural Residents(16,19). Revealing that, urban residents were 29% more aware of COVID-19 disease than rural residents. Our finding in line with on the disparity of mobility adaptation across different income groups in US cities and Canada during the pandemic(26,27). Implying that, the lowest quintiles were 10% less knowledgeable than the highest income quintiles. Regarding disparities in information about COVID-19 based on income and residence information from multimedia, the higher income quintiles and urban resident are favored. Implies that those in the top income quintiles had 24% and 17% more information on COVID-19 from multimedia and social media sources, respectively, than those in the lowest quintiles. This finding in opposes with study conducted in china on urban and rural disparities of personal health behaviors and utilization of up-to-date information about COVID-19(18,21). Revealing that, compared to rural residents, urban residents had 24 % and 39 % less information on COVID-19 from health care professionals and community networks, respectively. The discrepancies is due to infrastructures barriers of access to media is too low in rural community of Ethiopia and rather in community network and health professional information relatively more effective in addressing rural communities than other media like multimedia and print media. In general, our

finding implies that health care professionals and community networks are more effective in rural areas than other media such as television and radio, as well as print media. According to our findings, information about COVID-19 was fair among all residents via social media.

Conclusion

We found that those with the highest income levels and those who living in urban area were disproportionally more aware of COVID-19 infections, spread, symptoms, and prevention mechanisms. Furthermore, people with the highest income levels and those who lived in urban areas had disproportionately more information on COVID-19 through multimedia such as television and radio. Despite this, rural residents got disproportionately more information on COVID-19 from professional health workers and community networks.

Recommendation

For public pandemics like COVID-19, we suggest that disadvantaged populations, such as rural and low-income communities, should be given special attention when it comes to timely appropriate awareness creation through community outreach using media and creating access to information sharing through low-cost community networks like religious institutions, volunteers, community associations, and public health workers.

References

1. Tadesse DB, Gebrewahd GT, Demoz GT. Knowledge, attitude, practice and psychological response toward COVID-19 among nurses during the COVID-19 outbreak in northern Ethiopia, 2020. New Microbes New Infect [Internet]. 2020;38:100787. Available from: https://doi.org/10.1016/j.nmni.2020.100787
2. WHO. Novel Coronavirus (2019-nCoV) Situation Report - 5 (25 January 2020). WHO Bull. 2020;(Novel Coronavirus-Situation Report):1–7.
3. Mario Coccia. knowledge and practice of Kaduna state health care providers on infection prevention and control of COVID-19 pandemic. Jmbsr. 2021;1(1):27–41.
4. Banda J, Dube AN, Brumfield S, Amoah AS, Reniers G, Crampin AC, et al. Knowledge, risk perceptions, and behaviors related to the COVID-19 pandemic in Malawi. Demogr Res. 2021;44(March):459–80.
5. Rogers MB, Pearce JM. Risk communication, risk perception and behavior as foundations of effective national security practices [Internet]. Strategic Intelligence Management: National Security Imperatives and Information and Communications Technologies. Copyright © 2013 Elsevier Inc. All rights reserved.; 2013. 66–74 p. Available from: http://dx.doi.org/10.1016/B978-0-12-407191-9.00006-5
6. Iio K, Guo X, Kong X, Rees K, Bruce Wang X. COVID-19 and social distancing: Disparities in mobility adaptation between income groups. Transp Res Interdiscip Perspect [Internet]. 2021;10(November 2020):100333. Available from: https://doi.org/10.1016/j.trip.2021.100333
7. Projections P. Brief. 2014;(July).
8. Srichan P, Apidechkul T, Tamornpark R, Yeemard F, Khunthason S, Kitchanapaiboon S, et al. Knowledge, attitudes and preparedness to respond to COVID-19 among the border population of northern Thailand in the early period of the pandemic: a cross-sectional study. WHO South-East Asia J public Heal. 2020;9(2):118–25.
9. Mekonnen M. KNOWLEDGE MANAGEMENT DURING COVID-19 : REVIEW OF DEVELOPMENT ORGANIZATIONS ' PRACTICES AND EXPERIENCES. 2021;
10. Johnson B. Advancing Understanding of Knowledge's Role in Lay Risk Perception.

RISK Heal Saf Environ. 1993;4(3):3.
11. Sulistyawati S, Rokhmayanti R, Aji B, Wijayanti SPM, Hastuti SKW, Sukesi TW, et al. Knowledge, attitudes, practices and information needs during the covid-19 pandemic in indonesia. Risk Manag Healthc Policy. 2021;14:163–75.
12. Ali SH, Foreman J, Tozan Y, Capasso A, Jones AM, DiClemente RJ. Trends and predictors of COVID-19 information sources and their relationship with knowledge and beliefs related to the pandemic: Nationwide cross-sectional study. JMIR Public Heal Surveill. 2020;6(4):1–15.
13. Zhong Y, Liu W, Lee TY, Zhao H, Ji J. Risk perception, knowledge, information sources and emotional states among COVID-19 patients in Wuhan, China. Nurs Outlook [Internet]. 2021;69(1):13–21. Available from: https://doi.org/10.1016/j.outlook.2020.08.005
14. Wang Y, Yang J, Zhuang X, Ling Y, Cao R. Linking genomic and epidemiologic information to advance the study of. 2022;1–8.
15. Alene KA, Gelaw YA, Fetene DM, Koye DiN, Melaku YA, Gesesew H, et al. COVID-19 in Ethiopia: A geospatial analysis of vulnerability to infection, case severity and death. BMJ Open. 2021;11(2):1–11.
16. Chen X, Chen HH. Differences in preventive behaviors of covid-19 between urban and rural residents: Lessons learned from a cross-sectional study in china. Int J Environ Res Public Health. 2020;17(12):1–14.
17. Huang Q, Jackson S, Derakhshan S, Lee L, Pham E, Jackson A, et al. Urban-rural differences in COVID-19 exposures and outcomes in the South: A preliminary analysis of South Carolina. PLoS One [Internet]. 2021;16(2 February):1–21. Available from: http://dx.doi.org/10.1371/journal.pone.0246548
18. Inkelas M, Blair C, Furukawa D, Manuel VG, Malenfant JH, Martin E, et al. Using control charts to understand community variation in COVID-19. PLoS One. 2021;16(4 April):1–11.
19. Zhang J, Zhu L, Li S, Huang J, Ye Z, Wei Q, et al. Rural-urban disparities in knowledge, behaviors, and mental health during COVID-19 pandemic: A community-based cross-sectional survey. Medicine (Baltimore). 2021;100(13):e25207.
20. Zhang J, Zhu L, Li S, Huang J, Ye Z, Wei Q, et al. Rural–urban disparities in knowledge, behaviors, and mental health during COVID-19 pandemic. Medicine (Baltimore). 2021;100(13):e25207.
21. Mas YL, Bsn LY, Mm LH, Bsm LZ, Bsn FY. Urban-rural Disparities on Personal Health Behaviors and the Influencing Factors during the COVID-19 Outbreak in China: Based on an Extended IMB Model. Disaster Med Public Health Prep. 2020;
22. Capasso A, Kim S, Ali SH, Jones AM, DiClemente RJ, Tozan Y. Socioeconomic predictors of COVID-19-related health disparities among United States workers: A structural equation modeling study. PLOS Glob Public Heal [Internet]. 2022;2(2):e0000117. Available from: http://dx.doi.org/10.1371/journal.pgph.0000117
23. Alsharqi OZ, Qattan AMN, Alshareef N, Chirwa GC, Al-Hanawi MK. Inequalities in Knowledge About COVID-19 in the Kingdom of Saudi Arabia. Front Public Heal. 2021;9(October):1–10.
24. Alobuia WM, Dalva-Baird NP, Forrester JD, Bendavid E, Bhattacharya J, Kebebew E. Racial disparities in knowledge, attitudes and practices related to COVID-19 in the USA. J Public Heal (United Kingdom). 2020;42(3):470–8.
25. Gilmore B, Ndejjo R, Tchetchia A, De Claro V, Mago E, Diallo AA, et al. Community

engagement for COVID-19 prevention and control: A rapid evidence synthesis. BMJ Glob Heal. 2020;5(10):1–11.
26. Brankston G, Merkley E, Fisman DN, Tuite AR, Poljak Z, Loewen PJ, et al. Socio-demographic disparities in knowledge, practices, and ability to comply with COVID-19 public health measures in Canada. Can J Public Heal. 2021;112(3):363–75.
27. Iio K, Guo X, Kong X, Rees K, Bruce Wang X. COVID-19 and social distancing: Disparities in mobility adaptation between income groups. Transp Res Interdiscip Perspect [Internet]. 2021;10(March):100333. Available from: https://doi.org/10.1016/j.trip.2021.100333
28. Lee M, Kang B, You M. Knowledge , attitudes , and practices (KAP) toward COVID-19 : a cross-sectional study in South Korea. 2021;1–10.

Ethical Considerations
Ethical clearance was obtained from EPHI Institutional review Board (EPHI-IRB-315-2020). During the data collection, written informed consent was obtained from each participant

Availability of data
The complete dataset will be available from the data repository of EPHI upon request.

Funding
No funding sources.

Competing interests
The author declares as there are no competing interests in this work

Authors' contributions
Dereje Y. participated in conception and design of the study, data curation, data analysis and interpretation, draft write up. Mulugeta G, Girum T Ashenif T, Hiwot A, Fikresilassie G, Senait A, Tefera T, And Arega Z, participated in review of the manuscript. All authors read and approved the final version of the manuscript.

Acknowledgment
We wish to thank the Ethiopian Public Health Institute (EPHI) for providing the COVID-19 Community Risk Perception and Behavioral Response survey dataset archive.