


# BMJ Open COVID-19 prevention practices in urban setting during early introduction of the disease: results from community survey in SNNP Region, Ethiopia

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## ABSTRACT

**Objective** To assess community practices related to COVID-19 prevention and its associated factors during the early introduction of the disease to the study area.

**Setting and participants** A community-based cross-sectional study was conducted in Southern Nations, Nationalities and People's Region, Ethiopia. Ten zonal towns with high population density and mobility and 1239 participants were included in the study.

**Outcome measure** A semistructured questionnaire was uploaded to SurveyCTO data collection system with security patterns. Mask usage was assessed by observation, while social distancing and handwashing were assessed by interview. Data were collected by health professionals who have Bachelor of Science degree and above and analysed using SPSS V.25. Descriptive statistics and binary logistic regression were performed.

**Results** From 1239 individuals, about half, 657 (53%), of respondents were women and about two-thirds, 795 (64.2%), were married. Nearly 9 out of 10 (90.3%) and about 8 out of 10 (82.0%) respondents reported that they frequently wash hands with soap and/or use sanitiser and keep social distancing as means to prevent COVID-19, respectively. Less than three-fifths (57.8%) of respondents wore masks during the interview. In summary, about half (48.9%) of respondents were practising the three recommended methods (social distancing, handwashing and wearing masks). Sex, educational status, family size and overall knowledge about COVID-19 were associated with practising COVID-19 prevention measures.

**Conclusion** COVID-19 prevention practice was low as only about half of participants were practising social distancing, handwashing and wearing masks. Although awareness creation has been implemented through different forms of media, it should be strengthened in different local languages. Concerned government bodies should strictly follow using masks in public gatherings.

## INTRODUCTION

COVID-19 is a highly infectious viral disease, and its main clinical symptoms include fever, dry cough, fatigue, myalgia and dyspnoea.<sup>1 2</sup> COVID-19 as a pandemic continues, causing huge social and economic impact and stress on the healthcare system of all countries in

## Strengths and limitations of this study

- The current study was first to cover multicentres (10 zonal towns) and report regional-level COVID-19 prevention practices at community level.
- The study could reach to adequate sample in the community during the early introduction of the disease to the study setting while there was great fear.
- Even though this study covered majority of towns in the region, this study was limited in addressing smaller towns and rural areas that account for the majority of the regional population.
- In addition, though the tool was checked for content and face validity, construct validity was not performed using statistical tests.

the world,<sup>3 4</sup> though many efforts have been carried out to contain the virus since the declaration of the disease as a pandemic.<sup>5</sup>

Prevention of COVID-19 in an urban setting of developing countries is challenging because of dense population, small informal dwellings, lack of access to clean water, multigenerational households with shared sanitation facilities, high level of social mixing and transient residents.<sup>6 7</sup> In addition, the presence of non-specific symptoms of endemic illnesses such as malaria and influenza in developing countries makes it difficult to differentiate those from COVID-19 symptoms.<sup>6</sup>

In Ethiopia, the first case of COVID-19 was registered in March 2020; and in the study region, it was registered in early May 2020. Since then, the Ministry of Health and regional health bureaus, in collaboration with different stakeholders, have been doing different activities to prevent and control the spread of the disease, but there was information gap on communities regarding COVID-19 prevention practices. To assist these responses, this study assessed practices

related to COVID-19 prevention activities and its associated factors in selected zonal towns in Southern Nations, Nationalities and People's Region (SNNPR), Ethiopia.

## METHODS

A community-based cross-sectional study was carried out from 18 May to 10 June 2020 in selected towns of SNNPR. SNNPR was the third largest region representing nearly 20% of the population of the country. The region had more than 56 ethnic groups and languages, making it the most diverse region in the country. The region was administratively subdivided into 18 zones, 1 city administration and 7 special woredas. Woreda is an administrative structure equivalent to a district with approximately 100 000 population. According to the census of 2007, in 2019/2020, the total population of the region was projected to be about 20.5 million.<sup>8</sup>

Sample size was estimated using a single population proportion formula at 95% confidence level, assuming proportion of population with good practice to be 50% and considering 5% margin of error, design effect of three and 10% non-response rate. The final sample size was 1268. The calculated sample size was allocated to 10 zonal towns based on the size of the population. Ten towns were purposely selected considering the potential risk of COVID-19, crowdedness and high mobility.

At the time of data collection, the country declared a state of emergency that was not strict where some people were moving in towns while the majority stayed at home. To include both populations staying at home and out of home, one-third of estimated sample size was allocated to out-of-home population in towns and the rest two-thirds were allocated to population staying at home.

In the study setting, towns are structured to the smallest administrative unit, kebeles. Kebeles in the towns were listed and two sample kebeles were selected randomly from each town. To select individual respondents, data collectors went to the centre of selected kebeles and spin pen to select the direction to start at the first house. The next household was selected from the next adjacent block in parallel position and continued until the sample size was fulfilled. Concerning the out-of-home population, every other person that data collectors met while moving to the next block was selected and interviewed, and this continued until the sample size was fulfilled. Residing in the selected kebeles for at least 6 months and age above 18 years were considered as eligibility criteria.

The questionnaire (online supplemental file 1) was prepared by reviewing relevant literature.<sup>7 9 10</sup> The tool consisted of sociodemographic characteristics, exposure to COVID-19, messages and knowledge, attitude and practice about COVID-19 and its prevention. Almost all questions had 'others' option and space to type other responses. The prepared tool was then shared with members of Emergency Operation Center (EOC) of COVID-19 response at regional level and Hawassa University Scientific Advisory Committee to address face and

content validity of the questionnaire and to understand that questions can capture required data. EOC consists of experts from regional health bureaus, local and international partners working on COVID-19 response, Hawassa Health Science College and Hawassa University. The questionnaire was initially prepared in English and then translated to Amharic parallelly by investigators that comprise different public health experts, and complemented for better version. The data collection tool was then uploaded to SurveyCTO data collection system with security patterns. Training was given to data collectors to have common understanding on data collection tools and process. Tool pretest was done in urban settings not included in actual study to familiarise data collectors and to test if there were any challenges during interview, and modifications were made based on field feedback. Nine data collectors who had Bachelor of Science degree and above and experience in data collection conducted face-to-face interviews, keeping COVID-19 prevention measures like social distancing and wearing masks. Field supervision and online monitoring were done daily to maintain data quality.

The Excel file downloaded from SurveyCTO server was exported to SPSS V.25 for data management. Those respondents with no information about COVID-19 were excluded from the main analysis. Descriptive statistics (like frequency, percentages, mean and SD) were used to describe study participants and variables. Potential predictors of practice were determined using binary logistic regression. Independent variables with p value of less than 0.20 during bivariate binary logistic regression analysis were included in multivariate binary logistic regression model. Finally, variables with p value of less than 0.05 during multivariate binary logistic regression were considered to have statistically significant association and were reported with adjusted OR (AOR) and 95% CI.

## Patient and public involvement

Even though respondents were not involved in the design, we disseminated the findings to stakeholders working on COVID-19 prevention and control, and findings were also disseminated through local media.

## RESULTS

Overall, 1239 respondents were included in the study, with a response rate of 97.7%. The reason for non-response, mainly, was the fear of COVID-19 transmission during the interview.

### Sociodemographic characteristics of respondents

About half, 657 (53%), of respondents were women and about two-thirds, 795 (64.2%), were married (table 1).

### Knowledge about and attitude towards COVID-19

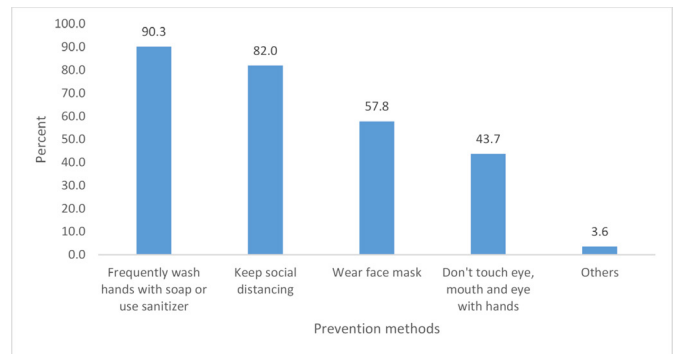
Seven knowledge questions about signs and symptoms, diagnosis of the disease, what to do if there is a suspect, drug to cure the disease, transmission mechanisms,

**Table 1** Sociodemographic characteristics of respondents

Variables	Category	Frequency	Per cent
Sex	Male	582	47.0
	Female	657	53.0
Age	≤25	304	24.5
	26–30	214	17.3
	31–35	145	11.7
	36–40	148	11.9
	41–45	74	6.0
	46+	213	17.2
	I don't know	141	11.4
	Marital status	Single	370
Married		795	64.2
Divorced		36	2.9
Widowed		31	2.5
Living separately		7	0.6
Educational status	No formal education	126	10.2
	Primary (1–8)	249	20.1
	Secondary (9–12)	375	30.3
	Certificate and above	489	39.5
Occupation	Student	172	13.9
	Farmer	29	2.3
	Merchant	315	25.4
	Employee	340	27.4
	Housewife	208	16.8
	Daily labourer	42	3.4
	Pensioner	30	2.4
	Private	52	4.2
	Other	51	4.1
Family size	≤5	858	69.2
	≥6	381	30.8
Religion	Orthodox	475	38.3
	Protestant	594	47.9
	Muslim	137	11.1
	Others	33	2.7

prevention methods and most at-risk groups were asked to determine level of knowledge. In summary, the mean score of knowledge was 52.3% (SD=18.9). Knowledge score was categorised using quartiles where the first quartile was labelled as poor and fourth quartile was labelled as good, while second and third quartiles were labelled as medium.

Eleven different attitude statements about the seriousness of disease, being at risk, possibility of prevention and benefits of staying at health facilities were given to respondents and their agreement to statements was measured using a 5-point Likert scale, from strongly disagree to



**Figure 1** Respondents' measures to prevent COVID-19, SNNPR, 2020. Others: cover coughs and sneezes with elbow, wear gloves, take hot drinks, keep outdoor clothes out, stopped eating raw food, pray, do sport, frequently check temperature and take vitamin C. SNNPR, Southern Nations, Nationalities and People's Region.

strongly agree. The overall sum of attitude responses showed that the mean score was 80.8% (SD=6.48). The overall score was categorised to quartiles where the first quartile was considered as negative attitude, second and third quartiles were considered as neutral, while fourth quartile was labelled as positive attitude.

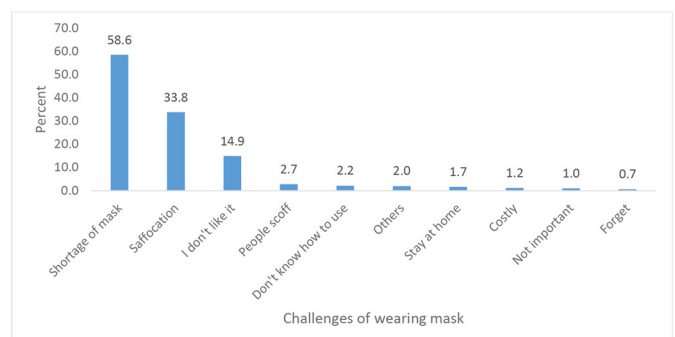
### Practice regarding COVID-19 prevention

Nearly 9 from 10 (90.3%) and about 8 from 10 (82.0%) respondents reported that they frequently wash hands with soap and/or use sanitiser and keep social distancing as means to prevent COVID-19, respectively. Less than three-fifths (57.8%) of respondents wore masks during the interview (figure 1).

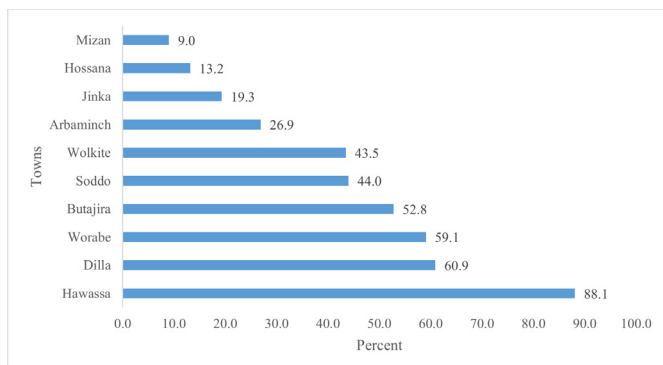
### Using masks

About two-fifths, 521 (42.2%), were not using any kind of masks during the interview. From those who wore masks, 212 (29.7%) were using medical masks (any kind) while others were using non-medical masks. Unavailability of masks was the major reason (58.6%) for not wearing masks and other reasons were presented in figure 2.

In summary, 605 (48.9%) were practising social distancing, cleaning hands and wearing masks.



**Figure 2** Reasons for not wearing masks, SNNPR, 2020. Others: allergy, don't know where to get, hot environment, medical problem, negligence, not sure of quality, think it (itself) brings the disease. SNNPR, Southern Nations, Nationalities and People's Region.



**Figure 3** COVID-19 prevention practice among towns, SNNPR, 2020. SNNPR, Southern Nations, Nationalities and People's Region.

The practice was highest in Hawassa (88.1%) and lowest in Mizan (9.0%) (figure 3).

### Factors associated with COVID-19 prevention practice

After running multivariate binary logistic regression, sex, educational status, family size and overall knowledge about COVID-19 were associated with practising COVID-19 prevention measures (table 2).

Women were 44% more likely to practise COVID-19 prevention measures as compared with male respondents (AOR at 95% CI: 1.44 (1.08 to 1.92)). Those who attended primary and secondary education, and had certificate and above education were 89%, 74% and 89% more likely to practise COVID-19 prevention measures, respectively, as compared with those who never attended education.

Respondents from larger ( $\geq 6$  members) household were 39% more likely to practise COVID-19 prevention measures as compared with those who had fewer number of family members ( $\leq 5$  members) (AOR at 95% CI: 1.39 (1.04 to 1.84)).

Respondents who have medium-level and high-level knowledge scores were 2.04 and 2.47 times more likely to practise COVID-19 prevention measures as compared with respondents with poor knowledge scores (AOR at 95% CI: 2.04 (1.51 to 2.75) and 2.47 (1.80 to 3.40), respectively).

## DISCUSSION

This study was done with the objective of assessing practices related to COVID-19 prevention methods and its associated factors, and the major finding was that only about half of respondents (48.9%) were practising social distancing, cleaning hands and wearing masks. Sex, educational status, family size and overall knowledge about COVID-19 were associated with practising COVID-19 prevention measures.

Nearly 9 from 10 (90.3%) and about 8 from 10 (82.0%) respondents reported that they frequently wash hands with soap and/or use sanitiser and keep social distancing as means to prevent COVID-19, respectively. Less than three-fifths (57.8%) of respondents wore masks during

the interview; and in summary, only about half (48.9%) of respondents were practising the three recommended methods (social distancing, cleaning hands and wearing masks). This result was low as compared with studies done in China<sup>10</sup> that showed practise of more than 95% and Saudi Arabia<sup>9</sup> that showed practise of 75% or more. This less practise as compared with other studies may be due to less attention given by the community due to smaller (less than hundred) cases in the region.

Respondents who attended primary and secondary education, and had certificate and above education were 89%, 74% and 89% more likely to practise COVID-19 prevention measures, respectively, as compared with those who never attended education. In addition, respondents who have medium-level and high-level knowledge scores were 2.04 and 2.47 times more likely to practise COVID-19 prevention measures as compared with respondents with poor knowledge scores (AOR at 95% CI: 2.04 (1.51 to 2.75) and 2.47 (1.80 to 3.40), respectively). The level of education was also reported as a significant factor in the study conducted in Sidama and Tigray regions of Ethiopia.<sup>11 12</sup> Moreover, studies done in South West Ethiopia,<sup>13</sup> Tigray<sup>12</sup> and Palestine<sup>14</sup> added that level of knowledge is a significant factor of COVID-19 prevention. This indicated that level of awareness is important to prevent the disease.

Women were 44% more likely to practise COVID-19 prevention measures as compared with male respondents (AOR at 95% CI: 1.44 (1.08 to 1.92)). Moreover, respondents from larger families ( $\geq 6$  members) were 39% more likely to practise COVID-19 prevention measures as compared with those who had fewer number of family members ( $\leq 5$  members) (AOR at 95% CI: 1.39 (1.04 to 1.84)). A similar finding was reported by a study done in South West Ethiopia.<sup>13</sup> This may be due to familial responsibilities to prevent the disease and opportunities to discuss the disease.

Even though this study was conducted early after the introduction of the disease to the region, awareness creation has been in place after early detection of the disease in China and the declaration of the disease as a pandemic. Response activities have been led in an organised way by the Ministry of Health and regional health bureaus since the introduction of the disease to the country. As part of their response, a state of emergency was declared and wearing masks was a must in some cases like in public transport and banks. Although there were misconceptions about using masks, the major reason for not using masks (58.6%) was its unavailability, which lowered mask usage and overall practice among participants. In addition to overall low practice, there was huge variation of practice ranging from as low as 9% to 88.1%. Improving access to masks and strengthening awareness creation on masks are crucial.

Because of the urgency of information needed during the early introduction of the pandemic to the study area, the tool used was limited as we did not validate it using statistical tests. Even though this study covered the

**Table 2** Binary and multivariate binary logistic regression

Variable	Category	Practise COVID-19 prevention		COR (95% CI)	AOR (95% CI)
		No	Yes		
Respondent status	Walking	213	192	1	
	At home	418	413	1.09 (0.86 to 1.39)	
Sex	Male	321	261	1	
	Female	310	344	1.36 (1.09 to 1.71)	1.44 (1.08 to 1.92)
Marital status	Single	191	179		
	Married	406	388	1.02 (0.79 to 1.31)	
	Others	34	38	1.19 (0.72 to 1.98)	
Educational status	No formal education	87	36	1	
	Primary (1–8)	127	122	2.32 (1.46 to 3.68)	1.89 (1.10 to 3.25)
	Secondary (9–12)	192	183	2.30 (1.49 to 3.57)	1.74 (1.02 to 2.98)
	Certificate and above	225	264	2.84 (1.85 to 4.35)	1.89 (1.07 to 3.35)
Occupation	Student	97	75	1	
	Farmer	25	3	0.15 (0.05 to 0.53)	
	Merchant	154	161	1.35 (0.93 to 1.97)	
	Employed	156	184	1.53 (1.06 to 2.21)	
	Housewife	106	100	1.22 (0.81 to 1.83)	
	Daily labourer	32	10	0.40 (0.19 to 0.87)	
	Pensioner	15	15	1.29 (0.59 to 2.81)	
	Private	23	29	1.63 (0.87 to 3.05)	
	Other	23	28	1.57 (0.84 to 2.95)	
Age category	≤25	171	133	1	
	26–30	130	84	0.83 (0.58 to 1.19)	
	31–35	81	64	1.02 (0.68 to 1.51)	
	36–40	77	70	1.17 (0.79 to 1.74)	
	41–45	42	32	0.98 (0.59 to 1.64)	
	46+	122	89	0.94 (0.66 to 1.34)	
	I don't know	8	133	21.37 (10.11 to 45.19)	
Family size	≤5	452	404	1	
	≥6	179	201	1.25 (0.99 to 1.60)	1.39 (1.04 to 1.84)
Overall knowledge	Poor	377	213	1	
	Medium	142	196	2.44 (1.86 to 3.21)	2.04 (1.51 to 2.75)
	Good	112	196	3.09 (2.33 to 4.13)	2.47 (1.80 to 3.40)
Overall attitude	Negative	168	168	1	
	Neutral	277	324	1.17 (0.89 to 1.53)	
	Positive	186	113	0.61 (0.44 to 0.83)	

AOR, adjusted OR; COR, crude OR.

majority of towns in the region, this study was limited in addressing smaller towns and rural areas that account for the majority of the regional population. In addition, though we included respondents staying at home and those moving in towns, the sample size allocation may not exactly represent respective population segment. Moreover, some of the reported practices like social distancing

might have been knowledge and may not be actual practice of respondents due to social desirability bias.

## CONCLUSION

COVID-19 prevention practice was low as only about half of participants were practising social distancing, cleaning



hands and wearing masks. Sex, educational status, family size and overall knowledge about COVID-19 were associated with practising COVID-19 prevention measures. Although awareness creation has been implemented through different forms of media, it should be strengthened in different local languages. Concerned government bodies should strictly follow using masks in public gatherings.

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**Contributors** All authors contributed to conceptualisation, design and data collection. ME developed SurveyCTO form and followed daily submitted data, managed data, and wrote the report and manuscript. AK, MH and ES facilitated financial support and managed the overall survey. AA reviewed the manuscript. All authors read and approved the final version.

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**Patient consent for publication** Not required.

**Ethics approval** Ethical clearance was obtained from the ethical review committee of the regional health bureau (reference number: E'6-19/6193). The study participants were informed about the purpose of the study and informed verbal consent was taken. Verbal consent was preferred and approved because of its popularity in the study setting and to minimise contamination during the pandemic. All collected data are kept confidential.

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**Data availability statement** Data are available upon reasonable request. All relevant data are within the manuscript. The datasets analysed during the current study are available from the corresponding author on reasonable request.

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