



## **Assessment of the Adherence to Standard Operating Procedures of Covid-19 among Market Vendors in Sironko District**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Authors AK and AW, conceived the research idea, and participated in the data collection & analysis and in writing the primary draft of the manuscript. Authors SAO, MSM and SN participated in data collection, advised on data entry plan and were major contributors in writing this manuscript. Authors HMK and JES were the senior advisors and supervisors in the study, were major contributors in writing of the manuscript and performed final editing of the manuscript. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Introduction:** Coronavirus disease is one of leading causes of deaths in recent times that has surpassed cardiovascular and other respiratory diseases. The World Health Organization (WHO) setup Standard Operating Procedures (SOPs) that have been adopted by the different governments to curtail its spread. Nonetheless, information on the adherence to the SOPs amongst market vendors is not well elucidated. Moreover, markets are centers of convergence of many people which increases the risks of community transmission. Therefore, our study, investigated the

extent of the adherence to the SOPs amongst market vendors in Sironko district.

**Methodology:** A quantitative study with cross-sectional design was adopted with a sample size of 221 randomly selected participants. Pretested structured questionnaires were used in the data collection. Categorical data was presented in tables and graphs with frequency (%). Pearson's Chi-square ( $X^2$ ) was used to examine the statistical significance of our results. The analysis was done by using the statistical software MedCalc version 20.0008. All the analyses were done at 95% level of significance and a  $p < 0.05$  was considered statistically significant.

**Results:** A total of 221 participants were involved: 126, 57 % female, 80, 36% aged between 31-40 years and 158, 72% married. Fever, dry cough, chest pain, arches & pain loss of speech & movements were the most reported signs and symptoms of COVID-19 ( $p < 0.0001$ ). Most of the respondents were aware of the SOPs, hand washing soap and adequate water were readily available ( $p < 0.0001$ ). The commonly implemented SOP was wearing face masks ( $p < 0.0001$ ). The radio talk shows & broadcasting were the main sources of information ( $p < 0.0001$ ). The inadequate facemasks and limited finances constrained the Implementation of SOPs ( $p < 0.0001$ ).

**Conclusion:** Most market vendors were aware of the COVID-19 SOPs and claimed they adhered. However, there is need to carry out a qualitative study to confirm the above claims.

*Keywords: COVID-19; market vendors; sironko district.*

## ABBREVIATIONS

*CDOs : Community Development Officers*  
*COVID : Corona Virus Disease*  
*DPO : District Production Officer*  
*LCs : Local Councils*  
*MTN : Mobile Telephone Network*  
*SARS : Severe Acute Respiratory Syndrome*  
*SCs : Sub- County chiefs*  
*SMS : Short Message Service*  
*SOPS : Standard Operating Procedures (SOPs)*  
*WHO : World Health Organization (WHO)*

## 1. INTRODUCTION

Globally, COVID 19 (SARS-CoV-2 )- is one of the deadliest, contagious and pandemic disease that has caused health burden in the recent times [1]. Coronavirus disease (COVID-19) is believed to have originated from Wuhan city of China and rapidly spread to Europe but it was more pronounced in Italy with 110,574 and 13115 cases and deaths respectively by April, 2020 [2]. The total global cases and death due to COVID -19 as of August 13 2021 were 206,252,248 and 4,348,200 respectively [1]. Recent reports have indicated that America has the highest number of cases (75,220,757) of which 33,120,632 (47.6 4 %) are in the United States (US). This is much higher than cases and deaths in Africa, Netherlands, Spain, Italy and Germany combined [3] . The latest cases of COVID-19 in Africa are, 4,688,762 with South Africa (SA) having the highest incidences and deaths of 2,327,472 cases and 68,192 respectively [4]. In East Africa, Kenya has the highest number of cases and deaths with

194,310 and 3,811 cases and deaths respectively. In Uganda, 91,162 cases and 2,425 deaths have been reported to date [4]. The actual number of cases in Sironko district are difficult to establish due to lack of the COVID-19 regional registry. However, informal interviews with the COVID-19 task force and health worker at Mbale Regional Referral Hospital (MRRH) indicates a rising number of new cases and deaths in this area.

The available scientific evidence has proved that the predominant mode of transmission of human-to-human SAR-CoV-2 is through respiratory cough droplets or sneezing by the infected persons. Studies of isolated patients of COVID-19 in hospital wards have reported natural SAR-CoV-2 RNA contaminations are commonly found on items, surfaces, outdoor environment as vehicles of transmission [5,6,7,8]. Fever, fatigue, myalgia and dry cough were highly cited as the most common signs & symptoms of the COVID-19 patients [9,10,11,12,13,14]. It has also been documented that arches & pains, nasal congestions, cold, sore throats, dyspnea and dry cough, muscle arches, chills, headaches, trembling, and loss of smell and taste are also signs & symptoms of COVID-19 [9-14]

With clear knowledge on the transmission modes of COVID-19, the WHO developed Standard Operating Procedures (SOPs) with the aim of restraining its spread and several countries including Uganda have adopted them [15]. The most common SOPs and stringent measures are; avoid handshakes, hugging, washing hands more frequently with soap or sanitizing, putting

on face masks when walking through crowded places, social distancing, keeping room well ventilated, coughing in bent elbow or tissues, lockdown, quarantine and night curfews [9, 16]. Currently there is no effective cure and vaccination for COVID-19 [1] and therefore, adherences to the SOPs remains the best option of containing the spread of this disease. Nonetheless, no comprehensive market vendors-oriented studies have been documented, despite the potential hotspots of markets for community transmission. Therefore, the current study sought to understand the level of adherence to the SOPs for COVID-19 amongst the market vendors in Sironko district.

## 2. METHODOLOGY

### 2.1 Study Area

Sironko district is situated within the geographical coordinates of 1°10' N & 1°20' N and 34°15' E & 34°32' E respectively and lies at average elevation of; 3996 ft (1,218 above sea level and 275.9 km from Kampala, the capital city of Uganda (Google Map, 2020). The study was carried out in a total of four busiest markets in

Sironko and these: Mutufu, Gombe, Pato & Buteza markets. But there is no information on market attendees on adherence to the SOPs guidelines for the COVID-19 and so, is a paramount question for an investigation.

### 2.2 Selection of the Study Sites

We conducted a reconnaissance survey in our study area between the months of February to March 2021. The study sites were selected based on the advice of the District Production Officer (DPO), Sub-county chiefs (SCs) and the Community Development Officers (CDOs). A total of four markets were selected and these were; Mutufu & Gombe markets from Budadiri East and Pato and Buteza markets from Budadiri West. These markets were selected based on the information obtained from local leaders as the busiest places in the district on the designated market days. Nonetheless, there are no documented market-oriented studies for observance of COVID-19 SOPs in this district. Therefore, we quantitatively conducted a study on the adherence to SOPs for COVID-19 amongst the market vendors in Sironko district.

The Map of Elgon Sub-region with Location of Different Districts

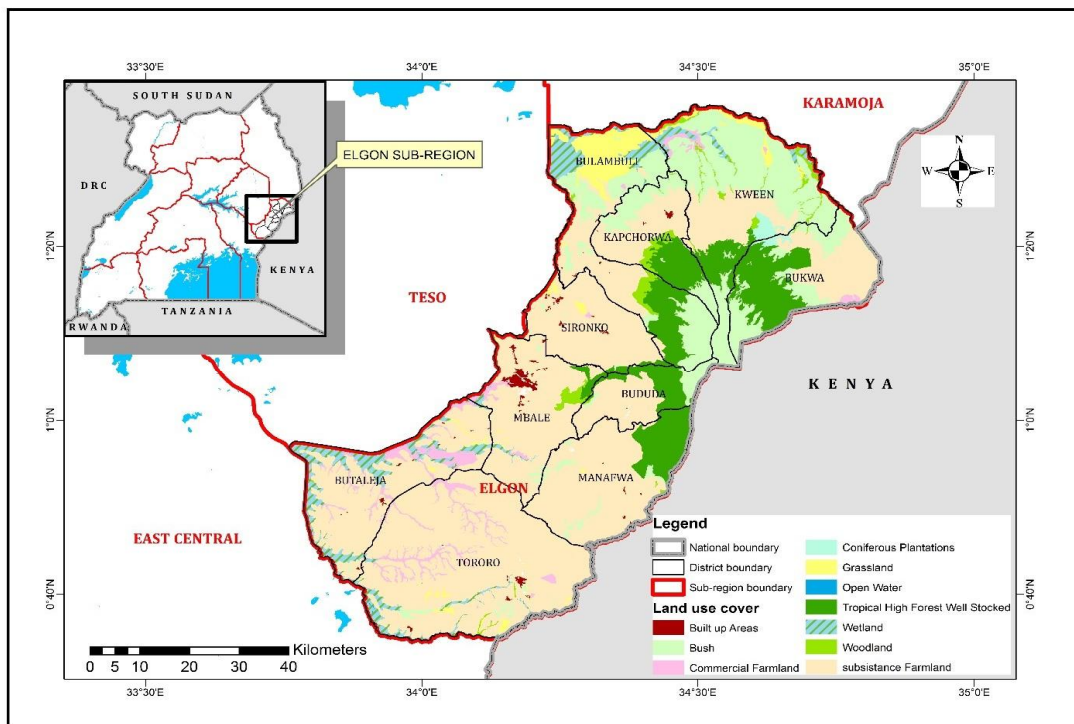


Fig. 1. Map of Elgon region with locations of different Districts

## 2.4 Study Design

The study adopted a quantitative cross-sectional survey and data collection from a specific group, at one point in time [17]. It was designed to assess knowledge on the awareness of the SOPs, source of information on the SOPs, signs & symptoms of the COVID-19, means of transmission of the COVID-19 as well as the challenges and prevention measures employed to limit the spread of the COVID-19.

## 2.5 Study Population

The total residential occupants in Sironko are 242,422 as per 2014 National Population and Housing Census [18]. The main tribe are Bagisu who are mainly peasants, and it is the 7<sup>th</sup> largest ethnic group in Uganda [18]. The study population comprised of all categories of market vendors in Sironko above 18 years old who were well conversant with local language (Lumasaba) and were traders in that market.

## 2.6 Selection of Participants and Sampling Techniques

We selected 221 participants (95 males and 126 females) from all the four market and were selected by simple random sampling technique. We excluded those below 18-years, communication challenges and confirmed mental illness.

The sample size was calculated from Cochran formula at 95 % confidence interval.

$$S = Z^2 * P * Q / E^2 \quad \text{or} \quad (S = Z^2 [P(1-P)] / E^2) \quad \text{where} \\ (Q = 1-P)$$

where S = sample size, Z = standard error for the mean = 1.96 at 95 % confidence level, P is the estimated prevalence or proportional ratio on knowledge about the SOPs among market vendors in Uganda as previously determined by Ibe et al. [19] = 82.6 %, E = Tolerable sampling error/ precision, = 0.05 at 5 % significant level  
 Sample size =  $1.96^2 [0.826(1-0.826)] / 0.05^2 = 221$

## 2.7 Data Collection

Pretested self and researcher-administered questionnaires comprising of closed ended structured questions were used. The questionnaires were made up of four sections. demographic data, means of COVID-19 transmission, signs & symptoms, and awareness and adherence to SOPs of COVID-19 in this

area. The questionnaires were prepared in English language but were translated into Lumasaba, to be easily comprehended by the locals and so the validity of the content was ensured. Self-administered questionnaires were collected back from the respondents, two days from the time they were served. This gave the participants ample time to comprehend the items in the questionnaire and so gave valid and appropriate responses. On the other hands, for researcher- administered questionnaire, the responses were instantly recorded at each session, they were immediately filed by the respective researcher. This saved time and as well ensured the safety, validity, and completeness of the data.

## 2.8 Data Analysis

The collected data was first cleaned and entered in the Microsoft excel and were exported to Statistical Package MedCalc version 20.008 for analysis. The analyzed data was presented as figures and tables for easy interpretation and analysis. All the analyses were done by using the Pearson's  $X^2$  test. The P values were elicited at 95% level of significance and a  $P < 0.05$  was considered statistically significant.

## 3. RESULTS & DISCUSSIONS

### 3.1 Socio-demographic Characteristics

The study had significantly more females than males ( $X^2=4.229$ , 95%CI=0.7% to 26.6%,  $p=0.0397$ ) and non-Ugandan participants ( $X^2=98.219$ , 95%CI=62% to 95%,  $p < 0.0001$ ). In addition, we had significantly more married persons than either the single, divorced or widowed ( $P < 0.0001$ ) and, at least majority had attained secondary level of education ( $P < 0.0001$ ) Most participants were aged between 31-40 years (80, 36 %) and the least were 61 years and above (14, 3 %). However, age ranges did not differ significantly ( $P \geq 0.05$ ) (Table 1).

### 3.2 Transmission Modes of COVID- 19 Disease

Various modes of transmission of COVID-19 disease amongst market vendors in Sironko district were identified. The findings indicated that majority of the respondents (145, 66 % & 123, 56 %) knew that COVID-19 was mainly spread through contact with cough droplets & physical contacts with infected persons (Fig. 2).

Contact with cough droplet was significantly higher ( $p < 0.0001$ ) than all other modes of COVID-19 transmission except for through physical contact with infected persons ( $X^2 = 2.798$ , 95%CI = -1.7% to 21.4%,  $P = 0.0944$ ) (Table 2).

### 3.3 Signs & Symptoms of COVID-19

Most participants agreed that patient with COVID-19 face difficulties in breathing or shortness of breathings (166, 75 %), loss of smell and taste (156, 71 %) fever (155, 70 %, dry cough (145, 66 %), chest pain (144, 65 %), arches and pain (165, 65 %) loss of speech and movement (132, 59 % were highly believed that as outstanding signs and symptoms of COVID-19.

Pertaining the participants knowledge about the potential signs and symptoms of COVID 19, interesting results were obtained. Fever ( $X^2 = 30.277$ , 95%CI = 25.9% to 51.8%,  $P < 0.0001$ ), dry cough ( $X^2 = 16.948$ , 95%CI = 14.7% to 40%,  $P < 0.0001$ ), Aches and pains ( $X^2 = 18.229$ , 95%CI = 16.3% to 42.1%,  $P < 0.0001$ ), Diarrhea ( $X^2 = 48.615$ , 95%CI = 40.5% to 67.1%,  $P <$

0.0001), Conjunctivitis ( $X^2 = 13.945$ , 95%CI = 12.4% to 38.3%,  $p = 0.0002$ ), Headache ( $X^2 = 10.189$ , 95%CI = 8.5% to 34.4%,  $P = 0.0014$ ), Loss of smell and taste ( $X^2 = 33.222$ , 95%CI = 27.9% to 53.6%,  $P < 0.0001$ ), Difficulty in breathing ( $X^2 = 43.894$ , 95%CI = 35.3% to 61.3%,  $P = 35.3\%$  to 61.3%), Chest pain ( $X^2 = 18.130$ , 95%CI = 16.2% to 42.2%,  $P < 0.0001$ ) and the loss of speech and movement ( $X^2 = 4.168$ , 95%CI = 0.6% to 26.8%,  $P = 0.0412$ ) were all perceived by the study participants as cardinal signs and symptoms of COVID 19 infection. On the contrary, tiredness ( $X^2 = 3.128$ , 95%CI = -1.2% to 24.7%,  $P = 0.0770$ ) and Sore throat ( $X^2 = 2.176$ , 95%CI = -3.2% to 22.7%,  $P = 0.1401$ ) were not perceived as key signs and symptoms of COVID 19 (Table 3).

### 3.4 Awareness of Standard Operating Procedures (SOPs)

The results above depict that 96 % of the respondents admitted being in the know of the SOPs ( $X^2 = 99.713$ , 95%CI = 60.6% to 96.2%,  $P < 0.0001$ ). Hence, market vendors in Sironko district were knowledgeable about the SOPs for the COVID-19 disease (Table 4).

**Table 1. Socio-demographic characteristics**

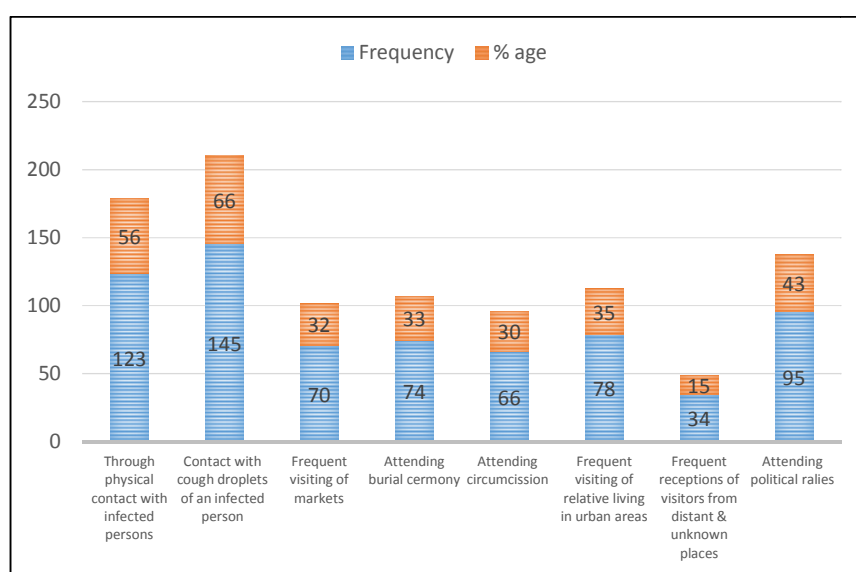
Characteristics	Frequency (%)	X <sup>2</sup>	95% CI	P value	
Gender	Male (Ref)	95(43)			
	Female	126(57)	4.229	0.7% to 26.6%	0.0397*
Age (Years)	18-25 (Ref)	34(15)			
	26-30	40(18)	0.118	-14.9% to 19.8%	0.7315
	31-40	80(36)	4.992	2.8% to 34.8%	0.0255*
	41-50	33(15)	0.000	-17.6% to 17.8%	1.0000
	51-60	20(9)	0.399	-15.5% to 22.8%	0.5275
	≥61	14(6)	0.725	-16.4% to 25.3%	0.3944
Nationality	Ugandan (Ref)	210(95)			
	Non-Ugandan	11(5)	98.219	62% to 95%	< 0.0001*
Marital status	Married (Ref)	158(72)			
	Single	16(7)	27.206	41.5% to 73.5%	< 0.0001*
	Divorced	20(9)	30.766	41.8% to 72.2%	< 0.0001*
	Widowed	27(12)	35.518	41.3% to 70%	< 0.0001*
Education Level	None (Ref)	25(11)			
	Primary	46(21)	1.107	-10% to 25.6%	0.2927
	Secondary	127(58)	18.336	27.2% to 58%	< 0.0001*
	Tertiary	16(7)	0.178	-19.5% to 22.6%	0.6730
	University	7(3)	0.404	-28.9% to 26%	0.5251

\*P value of sub group prevalence with respect to the group reference (where applicable) <0.05 statistically significant

**Table 2. Analysis of the perception of the relative contribution of the various modes of transmission of COVID 19 among the market vendors**

Transmission mode	Frequency (%)	X <sup>2</sup>	95%CI	P value
Contact with cough droplets	145(66) Ref			
Physical contact	123(56)	2.798	-1.7% to 21.4%	0.0944
Frequent visits to markets	70(32)	21.941	19.9% to 46.1%	< 0.0001*
Attending burial ceremony	74(33)	21.447	19.1% to 45%	< 0.0001*
Attending circumcision	66(30)	23.613	21.6% to 48.1%	< 0.0001*
Frequent visiting of relatives	78(35)	19.617	17.3% to 43%	< 0.0001*
Frequent reception of visitors	34(15)	28.956	33.6% to 62%	< 0.0001*
Attending political rallies	95(43)	12.329	10.1% to 34.9%	0.0004*

\*P value of sub group prevalence with respect to the group reference (where applicable) <0.05 statistically significant



**Fig. 2. Transmission Modes of COVID- 19 Disease**

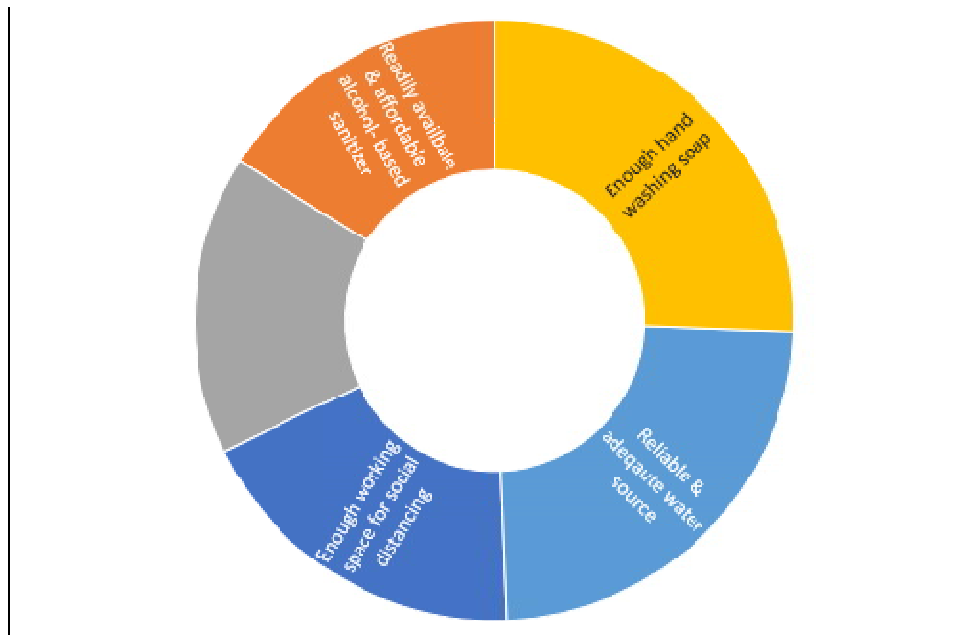
**Table 3. Analysis of the participant’s knowledge about the signs & symptoms of COVID-19**

Signs & Symptoms	Response		X <sup>2</sup>	95%CI	Analysis P value
	Agree Frequency (%)	Disagree Frequency (%)			
Fever	155(70)	66(30)	30.277	25.9% to 51.8%	< 0.0001*
Dry cough	145(66)	85(38)	16.948	14.7% to 40%	< 0.0001*
Tiredness	98(44)	123(56)	3.128	-1.2% to 24.7%	0.0770
Aches and pains	143(65)	78(35)	18.229	16.3% to 42.1%	< 0.0001*
Sore throat	99(45)	122(55)	2.176	-3.2% to 22.7%	0.1401
Diarrhea	48(22)	173(78)	48.615	40.5% to 67.1%	< 0.0001*
Conjunctivitis	82(37)	139(63)	13.945	12.4% to 38.3%	0.0002*
Headache	134(61)	87(39)	10.189	8.5% to 34.4%	0.0014*
Loss of smell and taste	156(71)	65(29)	33.222	27.9% to 53.6%	< 0.0001*
Difficulty in breathing	166(75)	55(25)	43.894	35.3% to 61.3%	< 0.0001*
Chest pain	144(65)	77(35)	18.130	16.2% to 42.2%	< 0.0001*
Loss of speech and movement	132(59)	89(45)	4.168	0.6% to 26.8%	0.0412*

\*P value of sub group prevalence with respect to the group reference (where applicable) <0.05 statistically significant

**Table 4. Analysis of the awareness of Standard Operating Procedures (SOPs) by the market vendors**

Awareness	Frequency (%)	X <sup>2</sup>	95%CI	P value
Yes	203(96)			
No	9(4)			
Total	212(100)	99.713	60.6% to 96.2%	< 0.0001



**Fig. 3. Available Facilities for Implementations of SOPs**

**Table 5. Analysis of the relative significance of the standard operating procedures among the market vendors**

SOP	Frequency (%)	X <sup>2</sup>	95%CI	P value
Readily available & affordable alcohol-based sanitizer	76(34) Ref			
Enough hand-washing soap	121(55)	8.224	6.7% to 33.9%	0.0041
Adequate source of water	112(51)	5.279	2.6% to 30.2%	0.0216
Hand-washing facilities	76(34)	0.000	14.8% to 14.8%	1.0000
Enough working space for social distance	87(39)	0.434	-9.7% to 19.3%	0.5100

\*P value of sub group prevalence with respect to the group reference (where applicable) <0.05 statistically significant; SOP: Standard Operating Procedure.

### 3.5 Available Facilities for Implementations of SOPs

The result further depicts that most of the facilities required for effective implementation of SOPs in Sironko district markets were still wanting. Majority of the participants (121, 55% & 112, 51 %) admitted having enough hand-washing soap, and adequate source of water respectively. Readily available & affordable

alcohol-based sanitizer, hand-washing facilities, and enough working space for social distance with corresponding frequencies and percentages of; 76, 34 %, 76, 34 %, & 87, 39 % (Fig. 3).

Availability of enough washing soap (X<sup>2</sup>=8.224, 95%CI=6.7% to 33.9%, P=0.0041) and adequate source of water (X<sup>2</sup>=5.279, 95%CI=2.6% to 30.2%, P=0.0216) were significantly more accessible than the alcohol-based sanitizers.

Therefore, there enough hand-washing soap and adequate source of water for implementation of SOPs among market vendors in Sironko district (Table 5).

### 3.6 Standard Operating Procedures Implemented at Sironko Markets

The participants in the present study exhibited a variety of knowledge on the various COVID-19 SOPs being implemented, as at least all the SOPs as guide by the Ministry of Health in 2020. The findings also indicate that most participant claimed that they always wear face masks in crowd places, regularly wash their hand-washing, avoided hand-shaking, social distanced & coughing or sneezing in the tissue or in the crease of the elbow most of the time with corresponding percentage of 90 %, 76 %, 66 %, 63 % & 57 % respectively. The rest of the response on other SOPs scored below average as far as their adherence on the COVID-19 prevention as can be seen in the figure above. The proportionality was higher for wearing face masks with respect to all other SOPs except

regular hand washing. Therefore, as in these findings wearing of masks in crowded places and regular hand-washing were the most claimed implemented the SOPs in the fight against the COVID-19 amongst market vendors in this area. However, these claims stand a test of time, and many be proved true or not based on other finding from observations.

### 3.7 Source of Information for COVID-19 SOPs

Radio talk shows & broad casting, telecommunication companies like Mtn, Airtel & Africell & word of the mouths were the key in propagating the message channels for the COVID-19 SOPs (198, 90 %, 157, 71 % & 145, 66 %) respectively (Fig. 5).

When we analyzed the relative contribution of the different information channels for the COVID-19 messages, Radio talk shows and Broadcast were significantly higher ( $X^2 \leq 29.882 \geq 98.148$ ,  $p < 0.0001$ ) than the information from all other sources (Table 6).

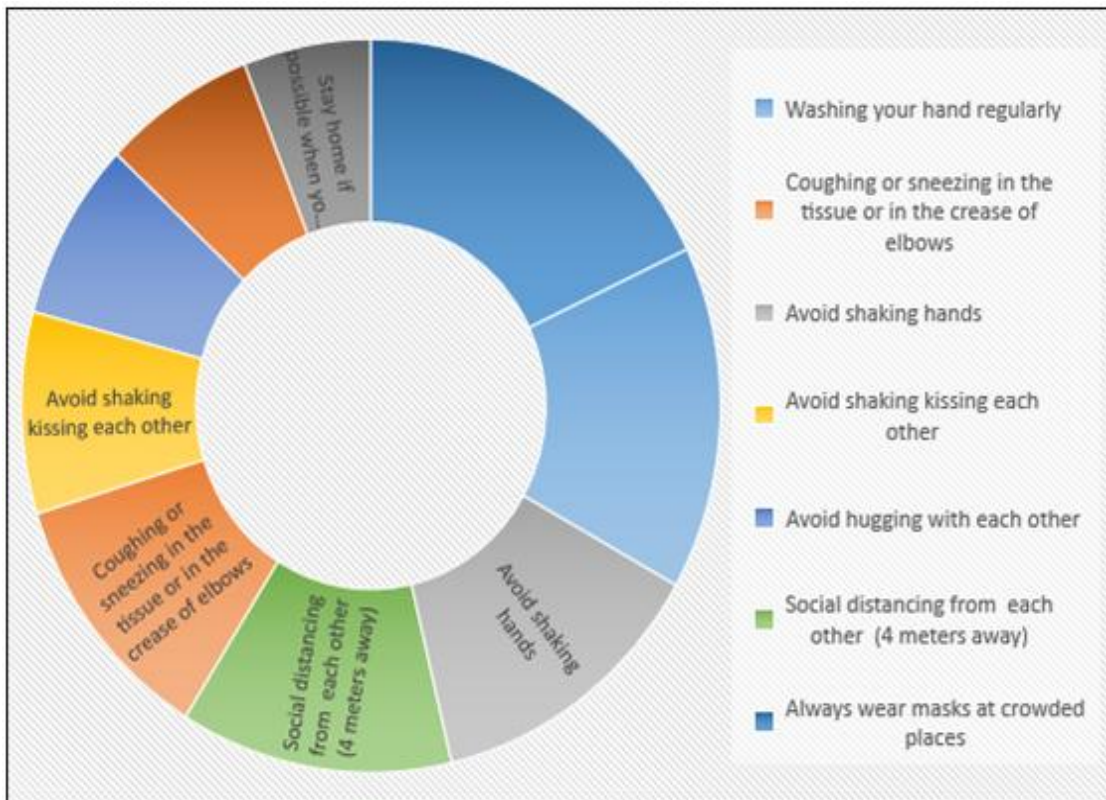
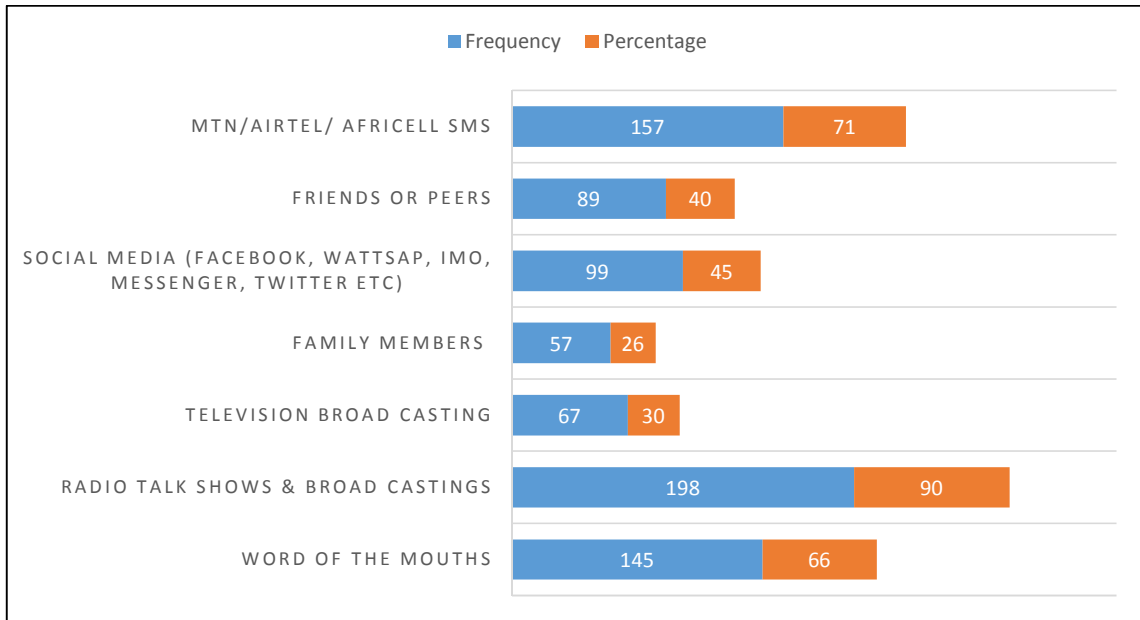


Fig. 4. Standard Operating Procedures Implemented at Sironko Markets





**Fig. 5. Source of Information for COVID-19 SOPs**

**Table 6. Analysis of the relative contribution of the information sources about COVID-19 among the market vendors**

Source of information	Frequency (%)	X <sup>2</sup>	95%CI	P value
Radio Talk Shows and Broadcast	198(90) Ref			
Family Members	57(26)	98.148	50.4% to 74.2%	< 0.0001*
MTN/Airtel/Africell SMS	157(71)	20.992	10.8% to 27.3%	<0.0001*
Friends/Peers	89(40)	80.509	38.5% to 60.2%	< 0.0001*
Social Media	99(45)	71.040	34% to 55%	< 0.0001*
Television	67(30)	95.323	47.2% to 70.2%	< 0.0001*
Word of the Mouth	145(66)	29.882	15.2% to 32.7%	<0.0001*

\*P value of sub group prevalence with respect to the group reference (where applicable) <0.05 statistically significant; MTN: Mobile Telecommunication Network, SMS: Short Message Service.

**Table 7. Analysis of the relative contribution of different challenges towards the implementation of SOPs for COVID 19 by the market vendors**

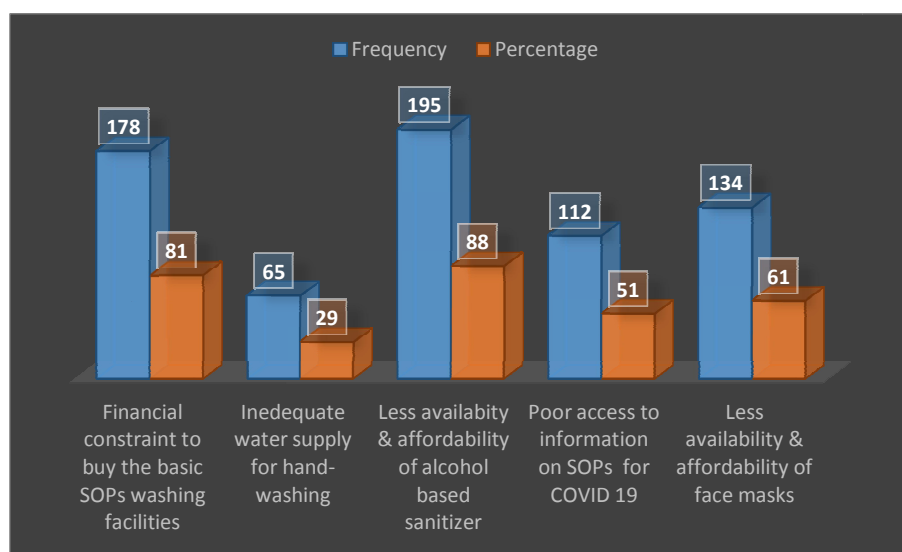
Challenge	Frequency (%)	X <sup>2</sup>	95%CI	P value
Low availability of alcohol-based sanitizers	195(88) Ref			
Financial constraint	178(81)	3.502	-0.4% to 14.5%	0.0613
Inadequate water supplies	65(29)	86.273	45.9% to 69.4%	< 0.0001*
Poor access to information on SOPs	112(51)	51.100	26.5% to 46.9%	< 0.0001*
Low availability of affordable face masks	134(61)	32.596	17.5% to 36.3%	< 0.0001*

\*P value of sub group prevalence with respect to the group reference (where applicable) <0.05 statistically significant

### 3.8 Challenges Faced in the Implementation of Standard Operating Procedures

Interesting and varied results were generated by the participants in our study. As 88 %, 81 %, 61

% & 51 % of the participants admitted that there was less availability & affordability of the alcohol-based sanitizers, financial constraints to buy basic the SOPs facilities, less availability & affordability of face masks & poor access to information on the SOPs on COVID 19



**Fig. 6. Challenges Faced in the Implementation of Standard Operating Procedures**

respectively. Market vendors felt that there few related water challenges as only 29 % of the respondent disagreed on the matter (Fig. 6).

With the exception of financial constraints, ( $X^2=3.502$ , 95%CI=-0.4% to 14.5%,  $P=0.0613$ ) which did not differ significantly when compared with the challenge of inadequate alcohol-based sanitizers, all other challenges had significantly lower contribution towards the implementation of the COVID 19 SOPs relative to the alcohol-based sanitizers ( $X^2\leq 32.596\geq 86.273$ ,  $P<0.0001$ ) (Table 7).

#### 4. DISCUSSIONS

It was found out that majority of the respondents were female (57 %) and mainly followed in the age bracket of 31-40 years (80, 36 %) and 95 % were Ugandan and mainly married (158, 72 %). The participants were mainly of low literacy class and secondary school dropout (127, 58 %). A significantly higher difference ( $p< 0.05$ ) was noted that between secondary school dropout with the rest of the education level in conformity with findings by Hutchinson, [20] and Abdul et al. [21]. We also found out that majority of the respondents (145, 66 % & 123, 56 %) claimed that COVID-19 was mainly spread contact with cough droplets and physical contact respectively. Other transmissions modes like circumcision ceremony, burial ceremony & political rallies registered little acceptance in this regard with corresponding percentages of; 32 %, 35 %, 15 %, 30 %, 33 % & 45 respectively. Contact with

cough droplet was significantly higher ( $p<0.05$ ) than all other modes of COVID-19 transmission. This finding is in agreement with recent findings by Peeri et al. [22] and Uwe et al. [23]. On the contrary, Yves & A, [24] revealed that COVID-19 was highly spread through air passengers from Wuhan to the whole globe.

Interestingly the respondents generated a variety of response on the signs & symptoms of C -19. Difficulties in breathing, loss of smell and taste, fever, dry cough, chest pain, arches and pain, loss of speech and movement were highly outstanding signs and symptoms of COVID-19 ( $p<0.05$ ). Diarrhea, Conjunctivitis (red, itchy & painful eyes, tiredness and sore throats were highly disregarded as COVID-19 signs & symptoms ( $p<0.05$ ). Similar observation were also made by Abdul et al. [21] who opined that cough & flu,, breathlessness and fever for COVID-19 were cited as major sign and symptoms for coronavirus disease as claimed by residents in Eastern Uganda. However, unlike the present study, their study never mentioned sore throat and loss of smell and taste as signs and symptoms of this new deadly disease. This was because their study was conducted shortly after COVID-19 outbreak before massive sensitization of this disease had conducted in rural area. Uwe et al. [23] reported some rare symptoms of COVID-19 such as on set of skin pain and arches among 25 % of the patient diagnosed for positive for this disease. This was attributed to compromising of the skin dermal function which accelerated the onset of skin

diseases [21]. Thomas et al. [25] found out that, dyspnoea, cough, fever, loss of taste & smell, fatigue, headache & chest pain. were highly cited as the most outstanding signs and symptoms of COVID-19 [25]. However, other signs and symptoms such as palpitation, tachycardia, low and high systolic pressure, positive auscultation, haemoptysis hypoxia & sputum production were cited in their but never surfaced in the current study. This could be attributed to difference in the type of the participants used in the two studies. For example, whereas their study was based on COVID-19 patients and as well experimental and so generated fewer bias results unlike the current study.

The findings in the present study also showed that majority of the respondents admitted to be knowledgeable of the SOPs ( $p < 0.05$ ) consistent with the findings by Ibe et al. [19], Naveed et al. [26] and Mabrouk et al. [27]. However, unlike the current study, which was based on market vendors, the participants in the aforementioned studies were medical professional and so gave responses from the technical point of view which could probably explain the minor differences in their findings and ours.

Additionally, having enough hand-washing soap and reliable and adequate source of water supply respectively compared to available alcohol-based sanitizer ( $p = 0.0231$ ) and hand-washing facilities all the time ( $p = 0.0041$ ). Therefore, enough hand washing soap and reliable and adequate source of water were the most available facilities for COVID-19 consistent with the findings by Abdul et al. [20] but contrary to the findings by Angham et al. [28] in Pakistan. Wearing face masks in crowded places was the most practiced and implemented SOPs in the fight against COVID-19 among market vendors ( $p < 0.0001$  in agreement with the study conducted by Ali et al. [29] and Ronald et al. [30].

Radio talk shows & broad casting, telecommunication companies & word of the mouths were key in propagating the message on COVID-19 ( $p < 0.05$ ). The rest of information channels for COVID-19, scored below the average percentage. Radio talk shows & broad casting, SMS and word of the mouth were significantly higher ( $p < 0.05$ ) than all the rest of information sources for COVID-19. Therefore, radio talk shows & broad casting, SMS and word of the mouth are potential sources of health messages that can sensitize the market vendors on SOPs for curtail COVID-19 disease consistent

with the findings by Ibe et al. [19] and Wang et al. [31]. The minor discrepancies in our study and the previous studies could be attributed to difference in literacy level between the two categories of participants as reported recently by Ibe et al. [19] and Shahmir et al. [32]. Unlike the present study, Heidi et al. [33] cited YouTube as the major source of information for the COVID-19. This difference could be attributed to the nature of participants and study locations between the two studies. Whereas their study was conducted among the high literacy class and in urban area was not the case of our study [33].

Interestingly, financial constraints to buy basic SOPs facilities less availability & affordability of face masks & poor access to information on SOPs on COVID 19 respectively were the most pronounced challenges in our study ( $p < 0.05$ ). Thus, for financial constraint to afford the SOPs facilities and less availability & affordability of face masks were the major challenges that hinder the adherence to the SOPs among market vendors in Sironko districts. The availability is attributed to the study location which lie within on the slopes of mountain Elgon that receive enough and reliable relief rainfall almost throughout the area and is a source of many streams. Our findings are also in agreements with previous scholars' like Khalid & Ali, [34] who ascertained that implementation of the SOPs for COVID-19 was largely hampered by inadequate facilities rather than awareness of the masses. On the contrary the study conducted by Sharifah et al. [35] showed that secondary schools and community surrounding Gayaza town had minimal challenges in implementing the SOPs as they had enough facilities like; temperature guns, enough sanitizer, soap and hand-washing water [35]. This was because their study was carried out in a highly urbanized areas of Uganda and in formal sectors where such facilities were readily available an affordable law enforcement is at the peak in Kampala and surrounding area where Gayaza lies, unlike our study, which was village-based study.

## 5. CONCLUSIONS & RECOMMENDATIONS

Physical contact of cough droplets and infected person were the most pronounced mode of COVID-19 transmission in this area. Difficulties in breathing, loss of smell & taste, fever, chest pain and loss of speech and movement were major signs and symptoms of COVID-19 noted in our study. Regular washing of hands and wearing

mask were cited as the main SOPs known to the masses. Radio talk shows & broad casting was the major source of information for COVID-19 SOPs and implementation of SOPs for COVID-19 was constrained by less availability of masks and finances to purchase SOPs facilities. We, therefore recommend that a qualitative study using other method like focus group discussions & observations needs to be carried out in the same area to verify the claimed adherence to SOPs of COVID-19 revealed in study.

### ETHICAL APPROVAL AND CONSENT

Approval for this study was provided by the Islamic University in Uganda, Research Review Committee. Permission to access the communities was obtained from Sironko and Bulambuli districts Local leaders including LC1 Chairpersons of the respective villages. We explained the purpose of the study to the respondents, provided oral informed consent and signed applied thumb print to register the participants in our study. In addition, verbal permissions were obtained from participants to allow the auto-recording of discussions and finally uniform transport refund was provided for all the participants.

### AVAILABILITY OF DATA AND MATERIALS

Data sets generated and analyzed during this study are available from the corresponding author on reasonable request.

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### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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