

THE STATE OF COVID – 19 IN UGANDA

by

Nabukeera Madinah (PhD)
Islamic University in Uganda
Faculty of management studies
Department of Public Administration
nabmadinah@gmail.com

Abstract

The cases and deaths of COVID-19 in Sub-Saharan African countries have been recorded to be few compared to other countries outside the continent. However, the countries in the region are vulnerable to the pandemic because of the health system which is weak and the poor health conditions of the people due to HIV/AIDs, malnutrition, and chronic respiratory conditions. As of April 2021, 40,751 cases and 335 deaths of COVID-19 have been confirmed in Uganda which is estimated to be a burden to the weak health system in the country. Thus, this paper analyzes the state of COVID-19 in Uganda. The study was based on descriptive design which employed only quantitative approaches. The study used secondary data extracted from the website of the Ministry of Health (MoH) in 2021. The Regression analysis and independent/two sample t test were used to examine the casual effect and compare the average prevalence of cases between male and female in different age categories respectively. The results indicated that the growth in weekly new COVID19 cases had a positive significant effect on weekly new COVID19 deaths in Uganda ($\beta=0.004$, $P\text{-value}<0.05$). The study suggested that more stringent measures should be put in place to curtail the growth in the cases of COVID19, the health centres handling patients with COVID-19 should be well equipped to help reduce on mortality related to the pandemic and Health workers need more training on how to treat COVID-19 patients.

Keywords; Covid-19, weekly COVID19 Cases, deaths, recoveries, Health centers, and Uganda

1.0 Background

The cases and deaths of COVID-19 in Sub-Saharan African countries have been recorded to be few compared to other countries outside the continent. However, the countries in the region are vulnerable to the pandemic because of the health system which is weak and the poor health conditions of the people due to HIV/AIDs, malnutrition, and chronic respiratory conditions.¹ As of April 2021, 40,751 cases and 335 deaths of COVID-19 have been confirmed in Uganda²

¹ <https://www.medrxiv.org/content/10.1101/2020.05.14.20102202v2.full.pdf>

² <https://www.health.go.ug/covid/>

which is estimated to be a burden to the weak health system in the country. Thus, this paper analyzes the state of COVID-19 in Uganda.

1.2 Objectives

1.2.1 Study Purpose

The purpose of the study was to analyze the state of COVID-19 in Uganda.

1.2.2 Study specific Objectives

- i. To examine the effect of the growth in the number of new weekly COVID-19 cases on the number of new COVID-19 deaths in Uganda.
- ii. To establish the effect of the growth in the number of new weekly COVID-19 cases on the number of new COVID-19 Recoveries in Uganda.
- iii. To compare the prevalence of COVID-19 cases between male and female in different age categories in Uganda.

1.2.3 Study hypotheses

The study was guided by the alternative hypotheses below;

Ha1: There is a significant effect of the growth in the number of new weekly COVID-19 cases on the number of new COVID-19 deaths in Uganda

Ha2: There is a significant effect of the growth in the number of new weekly COVID-19 cases on the number of new COVID-19 Recoveries in Uganda

Ha3: There is a significant mean difference in the prevalence of COVID-19 cases between male and female in different age categories in Uganda

2.0 Literature Review

The COVID-19 pandemic in Uganda is part of the ongoing worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged late December, 2019 in Wuhan, China. The virus started in a large animal and seafood market in city called Wuhan found in China. The World Health Organization (WHO) on 30 January 2020, declared SARS-CoV-2 as a public health emergency of international concern having spread to multiple countries outside China (World Health Organization 2020). By March

11, 2020, it was declared a global pandemic, with approximately 118,000 confirmed cases and nearly 4300 deaths on all continents except Antarctica (Migisha et al., 2020).

However, at that time Uganda had not yet reported any case of SARS-CoV-2 infection. As much as the virus was spreading fast in Europe, South and North America and Asia, in Africa it was slow in reaching compared to other parts of the world. Africa's first COVID-19 case was recorded in Egypt on February 14, 2020. By October 24, 2020, there were 1,696,285 cases of COVID-19 in Africa, with 40,922 (2.4%) deaths and 1,394,094 recoveries (Matovu, Kabwama, Ssekamatte, Ssenkusu, & Wanyenze, 2021). Uganda reported its first confirmed case of COVID-19 a traveler from Dubai on 21 March 2020. By April 2020, Uganda's cases had gone up from 1 to 54 cases and 1257 contacts were identified in the country (Migisha et al., 2020). More so, in April 2020 there were more sporadic community cases and by August the country had more widespread community infection (GoU, 2020b, 2021).

Subsequently, Uganda through the ministry of health implemented a series of public measures to limit the spread of the virus. On March 13, 2020, having realized the fast spread of Covid -19 in most other countries in the world, Uganda introduced multiple measures to prevent the entry and swift spread of the virus. These included symptom screening at the airport, isolation and testing for symptomatic persons, and a mandatory 14-day institutional quarantine and testing of travelers from high-risk countries, Persons entering from low-risk countries were asked to self-quarantine but were not tested unless they had symptoms on arrival. Travelers in quarantine were tested if they developed symptoms or on Day 14 of quarantine, regardless of symptoms (GoU, 2021).

Furthermore, on March 23, 2020, the country implemented more measures these included; a ban on all international travel, and closed both schools and universities. One day later, the Ministry of Health requested all travelers entering Uganda the United Arab Emirates in the past two weeks to self-present for testing. Afterwards, all persons who had traveled from any international destination into Uganda since March 7 were asked to self-present for testing. On March 30, 2020, the country instituted a complete lockdown, banning all public transport and public gatherings. Non-essential businesses were closed too leaving only essential business such as local food stores, supermarkets, medical and veterinary supplies. Additionally, a mandatory curfew from 5am to 7pm was imposed. And no motorists are permitted to use public roads unless

they are listed among essential service providers authorized by the Office of the President (GoU, 2020b).

As the pandemic continued to unfold in the country, the government of Uganda came up with an institutionalized response to Covid-19 that is well structured with the aim to drive the national and district Covid-19 pandemic response under the leadership of a multi-sectoral National Task Force (NTF) established in the Prime Minister's Office, to enable it to advise the Cabinet and guide the government's overall actions and response. The NTF includes political and technical leaders from key government sectors such as health, security, trade, transport and finance, and the private sector, and is chaired by the Prime Minister. Similarly, at local government level, COVID-19 district task forces were established to co-ordinate and guide the district response to the pandemic, equally composed of the political and technical experts at that level (GoU, 2020a; Migisha et al., 2020).

More so, a Scientific Advisory Committee (SAC) with members drawn from academics and scientists was also setup to lead research, innovation, to generate scientific evidence and to use this to advise the NTF in the fight against Covid-19 in Uganda. However, the responsibility of public reporting concerning the issues of the pandemic remained in the hands of the president, NTF and the minister for health (Kadowa, 2020). With the threat of further imported cases, in April 2020, the NTF advised the President to strengthen measures. Since, the interstate movement of cargo trucks was not prohibited by the lockdown measures. The president was advised to allow two people per truck, one a driver and an accompanying assistant. However, the movement of trucks posed a major risk in terms of importation and further spread of the virus (Kiwauka, Waswa, Alemayehu, & Simbeye, 2020). Truck drivers were further subjected to enhanced screening at the points of entry, and their movement restricted to stops only at gazetted rest areas and isolation points to limit mixing with the local populace. Compliance with these measures were closely monitored and enforced by security personnel.

Further measures such as mandatory COVID-19 testing using PCR tests at the border points of entry were introduced for all truck drivers, with only those testing negative permitted entry to Uganda (Kadowa, 2020). As soon as the covid-19 infections started going down in the country, lockdown measures were gradually lifted by the government following the advice of SAC scientists and NTF. On May 5th 2020 the first easing on was made (Lumu, 2020). This decision

was based on advice from the SAC scientists on the absence of community transmission based on the first rapid assessment survey. Successively, factories, hardware shops, garages, metal workshops, restaurants were allowed, as well as the movement of public and private vehicles, but with strict requirements to follow standard operating procedures, particularly regarding hand-washing, temperature checks and social distancing. As lockdown measures were gradually lifted, the directives on the mandatory use of masks in public places and the observance of physical distancing were also communicated. Government launched a mass distribution of masks across the country for all people 6 years and older (EQUINET, 2020).

As the easing of the country continued, it was observed that in May, June and August 2020 sporadic community infections were on the rise through diffuse lines of transmission. Though cases of COVID-19 continued to rise in the community, the number of deaths were still low, with a high rate of recoveries. According to government of Uganda Covid-19 (report 2020), reported that by 30th September, a cumulative total of 8,129 COVID-19 cases were reported, with 4,260 recoveries and 75 deaths related to COVID-19. The case fatality rate (CFR) was 1% (GoU, 2020b). And by that time, the country was registering 1,300 cases and four deaths weekly. The Kampala Metropolitan area was most affected, with 2,735 total cases and 47 deaths. There were also reports of localized outbreaks, with 104 of the 137 districts reporting cases, and with 87 districts having active transmission, defined as cases reported within the last 14 days (GoU, 2021).

Given that situation, the Ugandan Government shifted focus towards strengthening community interventions away from the main focus on implementing measures to stop and limit the importation of cases into the country from international and cross border travel, in the current phase of community transmission. Since then, the response has been adapted to include measures to reduce the severity and fatality of infection and to avert negative socio-economic effects of the pandemic (GoU, 2020a). The measures include early detection and referral of cases, massive community engagement to ensure compliance with preventive measures, shielding vulnerable populations from exposure and scaling- up health facility capacities to avert severe cases and deaths.

It's important to note that the Lancet Commission data for the month of August cited Uganda as the top African country in suppressing COVID-19 and Uganda was ranked number 10 among

191 nations. By the end of year December 2020 in a mid of a stiff presidential elections Uganda had raised the total number of confirmed cases to 35,216, the death toll had rose to 251 and the number of recovered patients increased to 11,733, leaving 23,232 active cases at the end of the year (GoU, 2020a). In the a mid of all of this Uganda's economy was suffering a great deal due to covid-19 measures such as the lockdown. Owing to the high level of informality in Uganda's economy, it is not yet possible to assess the full magnitude of the economic impact of the lockdown, but the consequences for incomes and poverty are likely severe. Research results from July 2020 show that many informal entrepreneurs in Kampala had no income at all during the lockdown, and hence had to dip into their own savings, rely on government food support, or ask for help from family or friends to survive.

Amid January and April 2021, Uganda still had a positivity rate below 3%. However, Cases began climbing in May 2021 and positivity rates reached 18% by June 2. The Ministry of Health (MoH) reported 89,080 confirmed cases on 13 July 2021, compared with 54,669 cases on 06 June – an increase of 63%. Active cases on admission at the health facilities increased by 13% from 754 to 853; in addition, there was a fourfold increase in COVID-19 deaths within the same period.

Due to a resurgence of COVID-19 cases in the country 7th June 2021, the government of Uganda basing on the advice of SAC scientists and NTF re-imposed a 42-day nation-wide lockdown to prevent the spread of the virus. The lockdown saw the closure of public and private transportation and restrictions of movement and business operations (GoU, 2020a). This has negatively impacted the population's livelihoods in all parts of the country. The impact of the virus, as well as related preventative measures such as movement restrictions, led to concurrent, country-wide crises such as health crisis and an economic crisis. More to that, the increase in the infections led to the overwhelming of the fragile health care system of Uganda. By the time the president announced the total lock down in June 2021 the oxygen and other essential medical supplies had run low as daily cases continued to increase than in the past months. This was supported by President Museveni's address to the nation in which he warned that hospitals are full, before adding that the rapid surge in the intensity of the pandemic appears unprecedented, but still manageable by introducing restrictions similar to those employed at the beginning of the pandemic.

Before the resurgence of the Covid-19 cases, Uganda had started its vaccination programme way back in March 2021. The Ministry of Health on March 6, 2021 received 864,000 doses of the AstraZeneca Covid-19 vaccine, shipped via the COVAX facility the world's facility for universal access to Covid-19 vaccines. Subsequently, Ugandan Health Minister Jane Ruth Aceng received a COVID-19 vaccine injection as the first person in the country's immunization campaign. Uganda's target by then was to vaccinate 49.6 per cent of the population, which is about 21,936,011, in a phased manner. Each phase was planned to cover 20 per cent of the population—approximately 4.38 million people as noted by the health minister of Uganda (Kanyike et al., 2021). Uganda started its vaccination program among priority groups like health workers, teachers, those with chronic diseases among others in early March 2021. By 3 June 748,676 vaccine doses had been administered.

The primary reason for taking up of the COVID-19 vaccine was required to subsequently avert its spread. Since then, a number of different Covid-19 vaccines have been administered to the Ugandan nationals. These include, Oxford/AstraZeneca, Sinovac, Pfizer, Moderna, Johnson and Johnson and most of these are donations from countries such as USA, China, and France among others. However, there has been low acceptance of the vaccine among the people and this is because many people have relied on social media that provided with negative information. This poses an evident risk on the battle towards COVID-19 in the future especially when these future health professions are expected to be influencing decisions of the general public towards the same (Kanyike et al., 2021). Presently according to the ministry of health report Uganda has managed to administer 9.76m doses of Covid-19 and 1.41m people are fully vaccinated giving 3.1% of fully vaccinated people in the country.

Unfortunately, due to all the efforts of the country to curb down the infections, Uganda for the last one month is seeing a resurgence in the Covid -19 cases and this due to the new variant called omicron. On 7th December 2021, Uganda reported to having registered seven cases of Omicron in the country. According to Ruth Aceng, minister of health, told reporters that seven people traveling into the country had tested positive for the variant. She said five of them came from Nigeria and two from South Africa. Although the virus spreads fast the minister assured Ugandans that the variant is not severe and there is nothing to worry about. So, the public should

remain calm and continue embracing vaccination. Because of that, East Africa countries would keep their borders open despite the concerns over Omicron (Kanyike et al., 2021).

This is backed by Aceng's assurance that the country has adequate measures in place at the points of entry to detect importation of any variant. Bank of Uganda recently has raised its concerns that the new variant called Omicron of Covid-19 is casting uncertainty over the country's economic outlook. In its monthly monetary policy statement recently issued, the monetary authorities have cautioned that the Omicron variant could further disrupt the global supply chain, which may have spillover effects, thus having a negative impact on the domestic economic performance. Furthermore, the financial institution said that a third wave of the Covid-19 outbreak in the country could trigger a need for more stringent and protracted measures that would drag down the projected growth. And contact-intensive sectors, like education and hospitality, could further face the brunt of the pandemic if the infection rate increases. Despite increase in the covid-19 cases in the country due to the new variant the government of Uganda has insisted that come next year 2022 the economy must be fully opened as earlier promised and some of the contained domestic demand from the past two years would be released to stimulate the economic growth.

3.0 Methodology

The study was based on descriptive design which employed only quantitative approaches. The study used secondary data obtained from the Ministry of Health (MoH) website in 2021. The study used inferential statistics to provide answers to the study hypotheses. Regression analysis was conducted to assess the effect of the independent variable on the dependent while the independent sample t-test was conducted to compare the average prevalence of cases between male and female in different age categories. The preliminary stage involved descriptive statistics to ascertain whether the variables were normally distributed.

3.0 Summary of statistics of the study Variables

The summary of statistics presented in this section include means, standard deviations, and normality test. The results are presented in table 1.

Table 1: Summary of statistics on the study variables

Study Variables	Number of new COVID19 Cases per week (27 weeks)	Number of new COVID-19 Deaths per week (27 weeks)	Number of new COVID-19 Recoveries per week (27 weeks)	COVID-19 cases among Males distributed by age	COVID-19 cases among Females distributed by age
Descriptive Stat					
Mean	1363.52	10.74	494.59	356.50	133.90
Std. Deviation	1109.462	9.032	340.961	458.020	159.873
Test for normality (P-value)	0.018	0.030	0.222	0.008	0.020
<i>*Normally distributed at 5% level (Null hypothesis assumes normal distribution)</i>					

Source: Owner's computations based on MoH (2021)

Table 1 presents the means, standard deviations, and test for normality among the variables. Concerning the number of new COVID19 Cases per week, it is evident that the average number of new COVID-19 cases per week was 1364 cases and std. deviation of 1109 cases. In terms of COVID-19 death, the findings reveal that the average number of COVID-19 deaths per week was 11 deaths with a std. deviation of 9 deaths. In relation with COVID-19 recoveries, it is shown that the average number of COVID-19 recoveries per week was 495 with a std. deviation of 341 recoveries. Concerning COVID-19 cases among males distributed by age, the study established that the average number of male COVID-19 cases distributed among age groups was 357 cases with a std. deviation of 458 cases. For females, it was found that average number of cases distributed among age groups was 134 cases and a std. deviation of 160 cases.

4.0 Effect of the growth in the number of new weekly COVID-19 cases on the number of new COVID-19 deaths in Uganda

The study examined whether the growth in the number of new weekly COVID-19 cases had a significant effect on the number of new COVID-19 deaths in Uganda. The results are presented using a linear regression model in Table 2.

Table 2: Model findings on the effect of growth in the number of new weekly COVID-19 cases on the number of new COVID-19 deaths in Uganda

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.541 ^a	.293	.264	7.747

a. Predictors: (Constant), Number of new COVID19 Cases						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.735	2.389		1.982	.059
	Number of new COVID-19 Cases	.004	.001	.541	3.217	.004

a. Dependent Variable: Number of new COVID 19 Deaths

Source: Owner's computations based on MoH (2021)

The study found out that the growth in the number of new weekly COVID-19 cases had a positive and significant effect on the number of new weekly COVID-19 deaths in Uganda ($\beta=0.004$, $P\text{-value}<0.05$). It is indicated in the model that growth in new COVID-19 cases by one person every week increases on the new COVID-19 deaths by 0.004. This may imply that as COVID-19 cases grow every week, the people continue not to observe the COVID-19 SoPs which increases the cases among the population more particularly in the vulnerable groups like elderly people which could be the reason for the increase in COVID-19 deaths in the country.

The results from the model summary indicate that growth in the number of new weekly COVID-19 cases account for 26.4% of the variations in the number of new weekly COVID-19 deaths in Uganda and the remaining 73.6% are accounted for by other factors.

5.0 The effect of the growth in the number of new weekly COVID-19 cases on the number of new COVID-19 Recoveries in Uganda

The study made an attempt to find out whether the number of new weekly COVID-19 cases had a significant effect on the number of new COVID-19 Recoveries in Uganda. The effect was examined using a linear regression model at 5% level of significance as indicated in table 3.

Table 3: Model findings on the effect of the number of new weekly COVID-19 cases on the number of new COVID-19 Recoveries in Uganda

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.295 ^a	.087	.051	332.209

a. Predictors: (Constant), Number of new COVID 19 Cases

Coefficients ^a				
---------------------------	--	--	--	--

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	370.858	102.464		3.619	.001
	Number of new COVID 19 Cases	.091	.059	.295	1.545	.135

a. Dependent Variable: Number of new COVID 19 Recoveries

Source: Owner's computations based on MoH (2021)

The model findings in table 3 reveal that the number of new weekly COVID-19 cases had no significant positive effect on the number of new COVID-19 Recoveries in Uganda since the P-value (0.135) was above 0.05 level of significance. This indicates that the growth in the number of COVID-19 recoveries does not depend on the increase in the number of COVID-19 cases. The immune system of the people in Uganda is so strong and this could enable them to recover very first, thus this could be the reason why the growth in the number of cases is not a significant predictor. Therefore, factors like strong immune system and available health facilities could help to increase in the number of COVID-19 recoveries.

6.0 Comparison the prevalence of COVID-19 cases between male and female in different age categories in Uganda

The study assessed whether there was a significant difference in the prevalence of COVID-19 cases between male and female in different age categories in Uganda. This was assessed using independent sample t-test as shown in table 4.

Table 4: Mean comparison in the prevalence of COVID-19 cases between male and female in different age categories in Uganda

. ttest Male == Female, unpaired

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Male	10	356.5	144.8386	458.02	28.85226	684.1477
Female	10	133.9	50.55634	159.8732	19.53362	248.2664
combined	20	245.2	78.90416	352.8701	80.0517	410.3483
diff		222.6	153.4085		-99.69932	544.8993

diff = mean(Male) - mean(Female) t = 1.4510
 Ho: diff = 0 degrees of freedom = 18

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.9180 Pr(|T| > |t|) = 0.1640 Pr(T > t) = 0.0820

Source: Owner's computations based on MoH (2021)

Based on the t-test findings, it is evident that there was no significant mean difference in the prevalence of COVID-19 cases between male and female in different age categories in Uganda since the P-value (0.1640) for the mean difference was above the 0.05 level of significance. From table 4, it is observed that the average prevalence of COVID-19 cases in males of different age groups was 357 cases while that for females was 134 cases. The findings imply that the prevalence of COVID-19 cases in both males and females of different age categories is almost the same.

This may imply that both males and female possess similar features that make them vulnerable to the spread of COVID-19. For example, both males and females do not follow very well the COVID 19 SoPs put in place to deter the spread of the pandemic. For example, they don't effectively; maintain social distance, wear masks, and wash hands. Therefore, this makes them to be equally vulnerable to COVID-19 which is consistent with the findings from the study.

7.0 Conclusions

The study firstly concludes that the growth in the number of new weekly COVID-19 cases positive and significantly affect the number of new weekly COVID-19 deaths in Uganda. This

means that there is a strong likelihood for the rise in the new weekly COVID-19 deaths in Uganda given the growth in the number of new weekly COVID-19 cases.

Secondly, the study concludes that there is no significant mean difference in the number of COVID-19 cases between male and female of different age categories. Therefore, the average number of cases in both males and females aged from 0-9 years, 10-19 years up to 90 to 99 years is almost the same.

8.0 Recommendations

- i. More stringent measures should be put in place to curtail the growth in the number of COVID-19 cases.
- ii. The health centres handling patients with COVID-19 should be well equipped to help reduce on mortality related to the pandemic.
- iii. Health workers need more training on how to treat COVID-19 patients.
- iv. The government should conduct more awareness on maintaining COVID-19 SoPs such as wearing masks and maintaining social distancing.

References

- EQUINET. (2020). Using evidence and analysis for an adaptive health system response to COVID-19 in Uganda in 2020. <https://www.equinet africa.org/sites/default/files/uploads/documents/Uganda%20COVID-19%20Rep%202020.pdf>, retrieved, September, 2020.
- GoU. (2020a). Presentation of report of first Rapid Assessment to determine community transmission of SARS-COV-2 (COVID-19) in Uganda'. <https://www.equinet africa.org/sites/default/files/uploads/documents/Uganda%20COVID-19%20Rep%202020.pdf>, retrieved, September, 2020.

- GoU. (2020b). Uganda's Emergency Response to the COVID-19 Pandemic: A Case Study. https://thinkwell.global/wp-content/uploads/2020/09/Uganda-COVID-19-Case-Study-_18-Sept-20201.pdf, retrieved, 23, October, 2021.
- GoU. (2021). UPDATE ON THE COVID-19 OUTBREAK IN UGANDA <https://www.health.go.ug/document/update-on-the-covid-19-outbreak-in-uganda-2/html>, retrieved, 14, August, 2021.
- Kadowa, I. (2020). Using evidence and analysis for an adaptive health system response to COVID-19 in Uganda in 2020.
- Kanyike, A. M., Olum, R., Kajjimu, J., Ojilong, D., Akech, G. M., Nassozi, D. R., . . . Matovu, D. (2021). Acceptance of the coronavirus disease-2019 vaccine among medical students in Uganda. *Tropical Medicine and Health*, 49(1), 1-11.
- Kiwanuka, F., Waswa, S., Alemayehu, Y. H., & Simbeye, J. A. (2020). Policy Decisions and Response to Fight 2019 Novel Coronavirus Disease in Uganda: A review of Attributes, Comprehensiveness and Implications to Improve Resilience to Future Pandemics.
- Lumu, I. (2020). COVID-19 response in sub-Saharan Africa: lessons from Uganda. *Disaster Medicine and Public Health Preparedness*, 14(3), e46-e48.
- Matovu, J. K., Kabwama, S. N., Ssekamatte, T., Ssenkusu, J., & Wanyenze, R. K. (2021). COVID-19 Awareness, Adoption of COVID-19 Preventive Measures, and Effects of COVID-19 Lockdown Among Adolescent Boys and Young Men in Kampala, Uganda. *Journal of Community Health*, 1-12.
- Migisha, R., Kwesiga, B., Mirembe, B. B., Amanywa, G., Kabwama, S. N., Kadobera, D., . . . Tindyebwa, T. (2020). Early cases of SARS-CoV-2 infection in Uganda: epidemiology and lessons learned from risk-based testing approaches–March-April 2020. *Globalization and Health*, 16(1), 1-9.