

# Factors Associated With Adherence to Lockdown Measures in Uganda

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## Research

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# Abstract

## Background

While the debate regarding the usefulness of the lockdown goes on in research, it has been highlighted that this debate is pointless unless studies demonstrate to what extent people are actually abiding by the lockdown. Studies on factors associated with adherence of COVID-19-related lockdowns have largely been conducted in western countries. However, similar studies are still lacking in low income countries like Uganda. This study fills this gap by investigating factors associated with adherence to lockdown in Uganda.

## Methods

A qualitative cross sectional survey was conducted online via the AfriSight platform with a sample size of 1249. These participants were selected randomly from all across Uganda. The data was analyzed descriptively and for inferential statistics we analyzed the data using probit regression. This allowed us to investigate the various motivations, socioeconomic, and demographic factors that help predict adherence or lack thereof to lockdown measures. Based on this probit analysis, we further generated marginal effects to ascertain the probabilities of adhering to lockdown.

## Results

Our study reports the complexity that characterizes adherence to the lockdown in Uganda. Various socioeconomic and demographic factors particularly, age, gender, size of household, religion, income level, and employment status all seem to uniquely interact in shaping adherence behavior.

## Conclusion

This study demonstrates that any lockdown-related efforts to minimize the spread of COVID-19 must pay attention to how these factors play out in the context of Uganda. Whereas most of the factors observed can more easily be handled in wealthier countries which provide social benefits during lockdowns, Uganda must rethink the uncritical adoption of such measures without localizing them. There is a need for Uganda to invest in a COVID-19 response that is alive to local context and reality, and one which commands wide support and adherence.

## Background

The onset of the Corona Virus Disease of 2019 (COVID-19) pandemic ignited a plethora of responses around the world. Most notably, countries around the world introduced the concept of lockdown as an intervention to help curb the pandemic. A lockdown simply means a government sanctioned decree limiting movement of people unless for essential reasons (Choudhary 2020). Lockdowns have received mixed reactions within research. Some scholars point out the importance of lockdowns in reducing the spread of the virus, protecting the health system from collapse and saving the lives of many vulnerable people (Dorigatti, et al. 2020, Ferguson, et al. 2020, Alvarez, Argente and Lippi 2020). Other scholars have been critical of lockdowns branding them disproportionate, and further suggesting that they have resulted in various negative externalities (Armitagea and Nellumsa 2020, Hellewell, et al. 2020, Keaveny 2020). While the debate of the usefulness of the lockdown goes on, it has also been highlighted that this debate is

pointless unless it is made clear to what extent people are actually abiding by the lockdown (Coroiu, et al. 2020). Some researchers have argued that the reasons why the lockdown has been successful in some areas and not in others lies in the public's propensity to adhere to the measures (Coroiu, et al. 2020, Anderson, et al. 2020)

Public health literature has already established that the success of non-pharmaceutical interventions such as lockdowns relies heavily on the public's behavioral change (Muzyamba, Groot and Tomini, et al. 2018, Anderson, et al. 2020). This is anchored on the principle of local-buy-in on the part of the people it is meant to serve. The extent to which local people identify with, and adhere to the intervention is key in the success of that intervention (Muzyamba, Groot and Pavlova, et al. 2017). Studies from western countries have demonstrated relative success in handling the scourge due to relatively higher adherence from the public (Coroiu, et al. 2020). Reasons as to why people adhere or not to COVID-19 regulations have generally been explored in the global north. Similar studies are still missing from the global south. This is despite the fact that most health care systems in the global south face severe threat from any increase in COVID-19 cases. While countries, particularly those in the global south have imposed lockdowns, it is not known in most Sub-Saharan African countries what factors lead to adherence. Uganda is one such country that implemented one of the toughest lockdowns in Africa. For example, the lockdown in Uganda in 2020 included closure of all educational institutions, imposition of travel restrictions and banning of public gatherings including places of worship, bars, music shows and cultural events (Republic of Uganda 2020, Development Initiatives 2020). Further, people arriving in Uganda from abroad were put under 14 days of mandatory quarantine in designated venues hotels. These measures were enacted from 18 March 2020. This was before Uganda had registered its first COVID-19 case. This action was lauded by both the World Health Organization (WHO) and the Africa Centre for Disease Control (Africa CDC) and branded as "decisive reaction against the pandemic" (Lirri 2020, 1).

On the same day that Uganda recorded its first COVID-19 case, Uganda closed its borders except for cargo and goods. Later, public transport was suspended and restrictions were placed on private vehicle movements. By the end of March 2020, there was a 14-days national curfew from 7pm to 6.30am which was extended in April for another 21 days. Wearing masks in public was also made mandatory as early as May before the country had 100 Covid-19 cases (Republic of Uganda 2020).

The strict lockdown measures in the country were credited for the relatively low cases recorded. As of December 2020, the cumulative number of cases in Uganda stood at 20, 459 with 205 deaths (WHO 2020). This made Uganda the ninth country with most Covid-19 cases in the Africa region representing about 1.4% of total confirmed cases in the region (WHO 2020). Other scholars also point to the fact that Uganda avoided a calamity in the healthcare system due to its strict lockdown. Despite all this, it is still not known what factors in the context of Uganda were associated with adherence to lockdown measures. Hence the aim of this study is to fill this gap by investigating factors associated with adherence to lockdown in Uganda.

There are several reasons that make Uganda an interesting case study when investigating the factors associated with adherence to lockdown measures. Uganda is ranked as a low-income country with an estimated population of 44.27 million, 75.64% of whom live in rural areas (World Bank 2020). Access to health care, especially for those in rural areas is generally low as most people do live almost five kilometers from a health facility (Odokonyero, et al. 2017). Health care delivery is further limited by the low number of health care workers in the country. Some health care facilities at the lower level of care, which provide health care to most people in rural areas, operate with staffing capacity that is as low as 50%. Consequently, the health worker density (number of health workers per 1, 000 people) is only 0.71 (Odokonyero, et al. 2017). Such a state of affairs coupled with a growing population has led to high burden of disease levels as reflected by mortality rates. The five leading causes of death in Uganda are infectious diseases including HIV/AIDS, Malaria and lower respiratory infections (World Health Organisation 2017). Therefore,

the advent of COVID19, a respiratory disease, poses a threat on the health care system which can lead to a total collapse of the system.

However, it cannot be definitely concluded that COVID-19's threat on the health care system is the only factor that that made people adhere to the lockdown regulations in Uganda. As a low-income country, the informal sector makes up to 50% of the population while employing as much as 98% of the labor force (Development Initiatives 2020). This sector was the hardest hit since restrictions imposed by the lockdown limited movement of people essentially halting trade in this sector. With a health care system that is inadequate to provide good health care services to the entire population even before the COVID-19 pandemic and a large proportion of the population relying on the informal sector, it is unclear what factors led the citizens of Uganda to adhere to the lockdown measures. This study fills this gap in literature.

## Methods

### Ethical clearance

Before collecting the data, we obtained written ethical clearance from UvA IRB board. Further, participants were informed of the objectives of the study, assured of strict confidentiality and made to sign a consent form after they had been sufficiently informed of the study and their right to withdraw from the study at any point should they see it fit.

### Data collection

Primary data was collected in Uganda in November and December 2020 via a cross-sectional survey on the AfriSight platform. AfriSight is a platform that regularly collects various forms of data in African countries. Particularly for this survey, participants were randomly recruited countrywide. A total of 1249 participants were included to form the sample size for this survey. Our selection of explanatory variables was informed by previous studies on adherence to COVID-19 interventions (Coroiu, et al. 2020), and the Andersen's behavioral model of health which argues that adherence to any given health intervention is based on three principles: predisposing factors (e.g socio-demographic factors), enabling factors (e.g. level of income, wealth) and healthcare needs (e.g. prevention of illness, existing conditions) (Andersen 1995). Based on this, we therefore included the following variables age, education level, gender, religion, household size, and marital status.

### Data Analysis

The data was analyzed descriptively (mean, standard deviation, percentage) and for inferential statistics we analyzed the data using probit regression. This allowed us to investigate the various motivations, socioeconomic, and demographic factors that help predict adherence or lack thereof to lockdown measures. Based on this probit analysis, we further generated marginal effects to ascertain the probabilities of adhering to lockdown.

## Results

Table 1 shows the summary demographics of our participants. The total sample size was 1249 with an average age of 28. Of that figure, 56% of them were male and 44% female. In terms of marital status, almost 69% of the participants were single, a further 30% were married and about 1% were either divorced or widowed. A great majority of the participants identified as being religious representing a proportion of 97%. Among those that were religious,

about 88% were Christian, 10% Muslim and 2% other. In terms of education, 74% had attained higher education, about 30% secondary education with the rest reaching only primary education or no education at all. It was also evident that 40% of the participants were unemployed, 28% running their own business and 30% were in full employment. Almost 68% of the participants were classified as being low income because they earned below 430, 000 shillings, and extra 19% middle income as they earned between 430, 000–762, 000 shillings and high income earners were about 13% with earnings above 762, 000 shillings. This classification is based on the World Bank classification of level of household wealth (World Bank 2020). The average size of household was 6.

**Table 1 Demographic data summary**

Variable	observations	Variable levels	Frequency	Percentage of total (%)
Gender	1242	Male	691	55.64
		Female	551	44.36
Marital status	1242	Single	858	69.08
		Married	366	29.47
		Divorced separated	14	1.13
		Widowed	4	0.32
Are you religious?	1094	Yes	1068	97.62
		No	26	2.38
Religious affiliation	1074	Christianity	945	87.99
		Islam	102	9.50
		Other	27	2.51
Education level	1242	Primary education & below	4	0.32
		Secondary education	299	24.07
		Higher education	939	74.65
Source of income	1242	Employed	383	30.84
		Running own business	354	28.50
		Unemployed	505	40.66
Income per month	1242	Below 430, 000 Shillings	843	67.87
		Between 430, 000 – 762, 000	240	19.32
		Above 762, 100 Shillings	159	12.80

Variable	Obs	Mean	Std. Dev.	Min.	Max.
Age	1249	27.898	7.967	18	65
Size of household	1242	5.475	3.571	1	77

By use of probit analysis, we identified factors that were associated with the likelihood of adhering to lockdown measures. We then calculated the marginal effects of the explanatory variables to ascertain the probabilities of adhering to lockdown; see Table 2 (for probit results) and Table 3 (for marginal effects). The results indicate that religious people were 3% more likely to adhere to lockdown measures as compared to those who were not religious. It was further demonstrated that people with higher income were 6% more likely to adhere as compared to those with low income. More still, the unemployed people and those running their own businesses were less likely to adhere. More concretely, as compared to the unemployed, people in employment were 8% more likely to adhere to the lockdown. The other important factor was level of education; more educated people were more likely to adhere to the lockdown than less educated people. Specifically, those with secondary education were 2% more likely to adhere as compared to those with primary education or less. The probability of adherence was even higher for those with higher education at 8%. Females also seem to have a higher probability of adherence than men by more than 1%. Similarly, older people have higher probability of adherence as compared to young people, and smaller sized-household also seem to have higher likelihood of adherence than those with larger house-holds of up to 1%.

## **Table 2**

<i>Adherence to lockdown=1</i> <i>No adherence to lockdown=0</i>		
Model detail		N. of obs= 1249 Prob > chi2 = 0.0000  Pseudo R2 = 0.0668
Independent variables		
		Coef
		SE
Religious (yes =1, no=0)		.028*** (0.00)
Level of income <sup>a</sup>	Middle income	.000** (0.02)
	High income	.015** (0.02)
Type of religion <sup>b</sup>	Muslim	.538 (0.11)
	Other	.001 (0.11)
Employment status <sup>c</sup>	Employed	.091** (0.04)
	Running own business	.061*** (0.00)
	Secondary	.011* (0.07)
Education <sup>d</sup>	higher	.020** (0.03)
Marital status <sup>e</sup>	Married	.012 (0.27)
	Divorced	-.076 (0.75)
	Widowed	.632 (0.31)
Gender (0=female, 1=male)		-.003** (0.05)
Age		.008* (0.07)
Average size of household		-.005** (0.06)

\* $P < 0.10$ ; \*\* $P < 0.05$ ; \*\*\* $P < 0.01$ ; SE = Standard Error

<sup>a</sup> reference is low income

<sup>b</sup> reference is Christians

<sup>c</sup>reference is unemployed

<sup>d</sup>Reference is no education

<sup>e</sup> reference is single

Table 3  
Marginal effects of the probit models

<i>Adherence to lockdown = 1</i>		
<i>No adherence to lockdown = 0</i>		
<b>Independent variables</b>		
Religious (yes = 1, no = 0)		0.03**
Level of income <sup>a</sup>	Middle income	0.00*
	High income	0.08**
Religion affiliation <sup>b</sup>	Christian	0.87
	Muslim	0.11
	Other	0.00
Employment status <sup>c</sup>	Employed	0.06**
	Running own business	0.02***
Education <sup>d</sup>	Primary	0.02***
	Secondary	0.02*
	higher	0.08**
Marital status <sup>e</sup>	Married	0.91
	Divorced	0.23
	Widowed	0.32
Gender (0 = female, 1 = male)		-0.01***
Age		0.02**
Average size of household		-0.01*
<b>Constant</b>		
Dependent variable is probability adhering to Lockdown. Maximum likelihood probit was used during estimation		
* $P < 0.10$ ; ** $P < 0.05$ ; *** $P < 0.01$ ; SE = Standard Error		
<sup>a</sup> reference is low income		
<sup>b</sup> reference is Christians		
<sup>c</sup> reference is unemployed		
<sup>d</sup> Reference is no education		
<sup>e</sup> reference is single		

## Discussion

Our study set out to investigate factors associated with adherence to the lockdown measure in Uganda. As informed by the Anderson model and previous research, we demonstrate that there are several socioeconomic and demographic factors that influence people's ability to adhere to the lockdown. Firstly, in Uganda, religion seems to play an important role in influencing people's desire to adhere to lockdowns. We observed that people who were religious were more likely to adhere than those who were not. This confirms what other studies on the link between COVID-19 measures and religion demonstrate; which is that religion seems to be an important aspect of uptake of COVID-19 measures (Newport 2020). Positions taken by religious leaders seem to influence their followers in following suit (Newport 2020). The widespread support of the measures by most religious leaders in Uganda could have been responsible for trend.

Further, level of income was another important factor. Higher-earning people seem to find adherence to lockdown much easier than those who earn less in Uganda. This is consistent with what other studies from elsewhere show (Broadbent, et al. 2020, Eyawo, Viens and Ugoji 2021). In most low income countries like Uganda, the poor are faced with eminent threat of hunger which might sometimes be caused by lockdown-precipitated restrictions that constrict their economic activities. In an attempt to navigate such traps, low income people could be violating lockdown measures more than those who do not face such threats. The Ugandan government was not providing COVID-19-relief social benefits to people who experienced financial distress following the lockdown, and thus the lockdown could have made the situation of the already-poor more dire; this could explain their high probability of breaking the lockdown rule. Related to this, our results showed that people in formal employment were more likely to adhere than those in the informal sector or those who were unemployed. As other studies have already confirmed, secure formal employment seems to offer a level of cushion to the potential threat of loss of income associated with lockdowns (Eyawo, Viens and Ugoji 2021, Mboera, et al. 2020).. Thus this group of people tend to have little difficulties in adhering than those who are unemployed or in informal employment. On the other hand, those in the informal sector struggle to adhere. This is because in Uganda people in the informal sector live hand-to-mouth, thus curtailing their daily economic activities presents threats to their survival (Lirri 2020). Without any protective social benefits from the state, their exposure to potential loss of income seems far much greater, and as such, they are more likely to break the lockdown rule in an attempt nudge and navigate this threat. Studies from similar sittings also come to the same conclusion (Mboera, et al. 2020). In line with the above, smaller number of people per household was linked to higher adherence. This could be related to the fact that smaller households tend to be more financially secure, with better and adequate housing. This could explain why they may find adherence much easier as compare to those living in more populated households.

Not only that, higher-level of education was associated with higher probability of adherence to the measures. Similar findings elsewhere demonstrate the same trend (Smith, et al. 202). It is plausible that in the context of Uganda, higher-level education increases the level of awareness of the pandemic and also predisposes those with higher education to financial stability and security. As already pointed out in the foregoing, those who are financially secure tend to have higher propensity of adherence than those are not.

The results also showed that women were more likely to adhere than men. Adherence to interventions and gender have long been studied in Sub-Saharan Africa, and most of the research point to women being more risk averse as compared to men (Berg, et al. 2004). In Uganda, this seems to be the case as well. Similarly, the elderly were more likely to adhere than younger people. Reasons for this could range from risk-aversion, and financial security on the part of the elderly as demonstrated in a similar study (Smith, et al. 202).

## Limitations

Given the complications that come with lockdown, we were unable to conduct our interviews in person. Our findings are thus only based on the views of respondents who had access to online platforms. This may have limited the variety and complexity of views and experiences represented. Despite that, we posit that the study provides useful insights in documenting and understanding the factors associated with adherence to lockdown in Uganda.

## **Conclusions**

We set out to investigate factors associated with adherence to the lockdown measure in Uganda. As informed by the Anderson model and previous research, we show that there are several socioeconomic and demographic factors that influence people's ability to adhere to the lockdown. Our study reports the complexity that characterizes adherence to the lockdown in Uganda. Various socioeconomic and demographic factors particularly, age, gender, size of household, religion, income level, and employment status all seem to uniquely interact in shaping adherence behavior. This means that any lockdown-related efforts to minimize the spread of the virus must pay attention to how these factors play out in the context of Uganda. Whereas most of the factors observed can more easily be handled in wealthier countries which provide social benefits during lockdowns, Uganda must rethink the uncritical adoption of such measures without localizing them. There is a need for Uganda to invest in a COVID-19 response that is alive to local context and reality, and commands wide support and adherence.

## **Abbreviations**

COVID-19- Corona Virus Disease of 2019

SBIR- Small Business Innovation Research

UvA- University of Amsterdam

WHO-World Health Organization

## **Declarations**

### **Ethics approval and consent to participate**

We obtained written ethical clearance from UvA IRB. Other than that, participants were thoroughly informed of the objectives of the study and asked to sign a written consent form before participating. For confidentiality purposes, the data was anonymized and securely stored on a computer.

### **Consent for publication**

Not applicable.

### **Availability of data and materials**

All materials relating to this study are provided

### **Competing interests**

The author declares no competing interests

### **Funding**

## Authors' contributions

CM provided leadership on all aspects of the study, while CM, GS, and OM also effectively contributed in carrying out the study including drafting the manuscript. All the authors read and approved the final manuscript.

## Acknowledgements

Not applicable

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