# Factors influencing compliance with public health directives and support for government's actions against COVID-19: A Nigerian case study

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### A R T I C L E   I N F O

### A B S T R A C T

Because COVID-19 is a novel viral pandemic, there is a dearth of research in the body of evidence that explore factors that can influence compliance with public health recommendations and Nigerian government's actions to prevent the spread of COVID-19. Hence, this study's aim is to address this gap to help inform policymakers and the actions of public health leaders in Nigeria. The study included a sample of 336 adult Nigerians who responded to an online Qualtrics survey. Descriptive and linear regression analyses were conducted to determine the predictors of compliance with COVID-19 public health directives and support for government's action against COVID-19 spread. Perceived risk of stigmatization, perceived threat of COVID-19, town/city, gender, and confidence in government's ability to curb the spread and impact of COVID-19 were found to be significantly associated with compliance with COVID-19 public-health directives, and support for governments action against COVID-19. Given Nigeria's weak health system and high level of poverty, there is need to ensure the public health responses to the pandemic are effective and contextually relevant. Nigerians and other concerned global health stakeholders will benefit from research that provides more information on issues of non-compliance with COVID-19 public health directives and government actions.

## Introduction

Over the years, different countries and regions have had various disease outbreaks, most of which have been effectively contained using different public health strategies. According to the World Health Organization [48], in the last two decades, there have been several epidemics of viral illnesses such as the Avian influenza in 2004 and 2005, the H1N1 pandemic in 2009, Ebola in 2014, and the Zika virus in 2015 and 2016. Also, there have been two outbreaks of coronaviruses in the last 20 years; the severe acute respiratory syndrome coronavirus (SARS-CoV) outbreak in China in 2002 that affected about

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8000 people, and the Middle East respiratory syndrome coronavirus (MERS-CoV) disease in Saudi Arabia in 2012 with about 2500 cases. These outbreaks accounted for about 1600 deaths [5,6]. However, none of these viral epidemics have had a more profound impact on global health and economy like the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This infection which causes the "coronavirus disease 2019″ (COVID-19) is a highly pathogenic viral disease of the respiratory tract that has caused hundreds of thousands of deaths worldwide since it was first identified in Wuhan, China in December 2019.

The European center for Disease Prevention and Control (ECDC) posited that between 31st December 2019 and 9th May 2020, there were approximately 9.4 million reported cases of COVID-19, with over 333,000 cases reported in Africa, and a global death toll of more than 482,000 deaths [11]. In Africa, though new cases are increasingly recorded every day, especially with the increasing testing capacity, COVID-19 is yet to have as much impact in African countries and communities as it has had on the rest of the world. The rates of infection in Africa are comparatively lower, but there are growing concerns that this may change over time. The continent has been projected to become one of the most affected continents in the coming years. According to the WHO Regional Office for Africa, about 44 million people could be infected within a year in Africa, and 190,000 people could die from the disease within this time [49].

In Nigeria, the first official case of coronavirus was confirmed on 27 February 2020 in Lagos, and since then, 22,020 cases have been confirmed with 542 deaths as at 25 June 2020 [27]. However, these incidence and mortality figures due to COVID-19 may not represent the true extent of the disease. As at the time of this report, Nigeria had tested less than 122,155 people, despite having a population of about 200 million. According to Akinwotu and Burke [42,43], there have been reports of unexplained deaths after brief illnesses in Kano state, the second most affected state in the country after Lagos state which has the highest recorded cases of COVID-19 in Nigeria. One possible factor for the underreporting of the mortality due to COVID-19 in Nigeria is the lack of death certification. Experts report that over 53% of deaths, most of which occur out of hospital, go unregistered, especially in developing countries like Nigeria [47]. The lack of adequate civil registration and vital statistics in the country suggests that the impact of the pandemic will most likely be continuously underestimated, and as a result, population-based public health measures targeted at the infection may prove inadequate in stopping the spread of the highly infectious disease. Therefore, Nigeria is expected to be one of the most severely affected if measures to contain the spread of the disease are not properly implemented [50,51,52].

Similar to most of other viral respiratory tract infections, the spread of COVID-19 is via direct contact with an infected person or their respiratory droplets [21, 38]. The transmission of the infection typically occurs from touching one's eyes, nose or mouth after touching an infected individual, or any surface or fomite they have touched, or on which they have deposited large virus-laden droplets [26]. The virus has been shown to survive on these surfaces and fomites for days [10]. It has also been observed that infection could occur when droplets are directly deposited on a person who is in close proximity to an infected individual or when virus-containing particles are spread in the air during coughing, sneezing or exhaling in an indoor environment [26, 40]. Furthermore, there is compelling evidence to show that asymptomatic carriers (i.e., showing no symptoms) of the virus can infect their close contacts just like symptomatic (i.e., showing symptoms) individuals [54], and as a result, this could create a burden that further complicates the fight against the infection. Population density also worsens the spread of infection as it increases the chances of human-to-human contact. This may explain the high rates of infection in cities like London and New York [8] were not unrelated to their populations. However, according to the Johns Hopkins School of Public Health [18], there is no proven link between urban density and higher rates of infection. Urban density alone did not predict the rate of infection, and this was evident in densely populated cities like Seoul, Hong Kong, and Taipei where the incidents and mortality of Covid-19 were successfully limited with robust health policies and interventions [15,16].

Furthermore, it is well recognised that poverty and other social determinants of health play vital roles in the spread of infections [35]. Nigeria is one of the countries most affected by the environmental health problems associated with poverty such as overcrowding, poor environmental sanitation and lack of access to clean water [2]. These factors are to be considered when putting modalities in place to control the spread of COVID-19.

Health experts advise that controlling the spread of Covid-19 involves controlling the source of infection, cutting off routes of transmission, and protecting the susceptible population. Strategies for achieving these include increasing capacity for testing, regular hand hygiene, observing social distancing, contact tracing, self-isolation for symptomatic and exposed individuals, and restriction of movements and travels [26, 54]. These strategies have been adopted by most countries of the world and following the confirmation of the first Covid-19 case in Nigeria, Federal government through the Ministry of Health and National center for Disease Control (NCDC), instituted most of these measures and embarked on media campaigns and community awareness via local authorities, in both English and local languages. These measures resulted in increased awareness about the virus across all ages, tribe, and socioeconomic status in a country whose adult literacy rate was estimated at about 62%, according to World Bank report (2020). Furthermore, one of the foremost strategies that the Federal government employed was an imposition of an initial 2-week lockdown on the 30 March 2020 in three states: Lagos, Abuja, and Ogun. The lockdown was later extended for an additional two weeks [19]. The lockdown involved strict restriction of movements, social and economic activities except for essential services. In Nigeria's recent history, there is no record of any pandemic of infectious disease that prompted such a drastic measure and had the tendency to alter the daily lifestyle and freedom of citizens on a large scale like the recent lockdown. These measures may result in drastic behavioural adjustments and harsher economic realities for Nigerians especially those in the states with the strictest lockdown stipulations [19].

Several factors may therefore influence compliance with public health recommendations and government's directives during health emergencies. Understanding these factors is essential to ensuring the success of public health emergency measures. As a novel disease, Covid-19 is a disease entity that is yet to be fully understood, hence, public perception of risk and compliance with health directives are expected to differ. The compliance with health directives may be influenced by psychosocial and sociodemographic factors such as gender, poverty, knowledge of the infection, perceived threat of a disease, stigma, and social trust [9, 19, 28, 39, 44, 45]. The announcement of the commencement of lockdown in Lagos, Abuja and Ogun States by the Federal Government raised concerns about its implications and possible non-compliance. Over 40% of Nigerians live in poverty, and for these people, survival is based on daily income, with little or no savings to cushion the effect of a lockdown. Therefore, complete adherence to the lockdown will seem unrealistic for them [19]. There is also the influence of stigma on compliance with health directives. The perception of stigma can affect public health directives in different ways, and according to Mackolil and Mackolil [23], the fear of contracting COVID-19 and subsequent anxieties about stigmatization may provoke uncooperative responses to public health recommendations. It is therefore important to explore the many factors that can influence the success of health directives in this pandemic.

Another factor that could potentially impact compliance with government's directives and public health intervention is public trust. There is ample evidence to suggest that large scale health initiatives are generally met with public suspicion, which in turn, affects compliance [32]. This was evident in the polio vaccination campaign which faced significant drawbacks, especially in Northern Nigeria [17].

Given that this is a novel viral pandemic, there appears to be a dearth of research in the body of evidence that explore factors that can influence compliance with public health recommendations and Nigeria government's actions to prevent the spread of COVID-19. Hence, this study aims to address this gap to help inform policymakers and actions of public health stakeholders in Nigeria.

## Method

### Participants and procedure

This study included a non-random sample of Nigerian men and women ($N = 336$), aged 19 to 76 years. The data were collected using a Qualtrics link that was published on 1) Group and personal pages on Facebook website, 2) various WhatsApp groups for Nigerians, 3) sent through text messaging, and 4) personal LinkedIn pages. The survey assessed participants' tendency to comply with COVID-19 public health recommendations, support for Nigerian government's actions to limit the spread of the virus, perceived confidence in federal and state governments' capacity to curtail the spread, and sociodemographic characteristics. The online survey was designed to last for about 20 min. Participants included in the study were not offered monetary or other gifts for study participation. This study was approved by the Institutional Review Board of a university in the northeast region of the United States.

### Measures

#### Primary outcomes
*Compliance with COVID-19 public health recommendations.* This variable is a measure of participants' likelihood to comply to public health directives on ways to combat the COVID-19 outbreak. The participants were presented with a prompt: "Thinking about the weeks ahead, please respond to each item using a scale from 0 (not at all) to 5 (very much) to indicate the likelihood that you would do the following during the government's mandated lockdown." Sample of the questions are "visit friends and family," "go to the market, attend a church/mosque service, use public transportation, go to a bar, etc. Ten questions were merged to form a composite variable that measure non-compliance with public health directives with Cronbach's $\alpha = 0.83$. Higher scores indicate higher non-compliance with COVID-19 public health recommendations.

*Support for government's action against COVID-19 spread.* This measure was adapted from Kennedy et al. [20] survey of Canadians' support for their government's interventions to curtail the spread of COVID-19. The adapted assessed how much participants support Nigerian government's actions such as canceling public events like sports games and festivals, closing places of worship, asking people to stay home, mandatory home isolation of those who might have been exposed to the Coronavirus, closing of schools, and closing offices and major trading markets. Participants responded to the questions on a 6-point Likert scale from 0 (very unfavorable) to 5 (very favorable). The scores of the 6 items were made a composite score with Cronbach's $\alpha = 0.86$. Higher scores indicate higher support for government's actions against COVID-19 spread.

#### Predictor variables
*Perception of COVID-19-related stigma.* The perceived stigma related to COVID-19 was assessed using 4-item statements that measured the degree to which participants agree with perceived COVID-19-related stigma. Example of items on the scale are: "a person diagnosed of Corona Virus will likely be stigmatized" and "if a person recovers from Corona Virus diagnosis, everyone in the community will likely abandon that person." Respondents responded to the questions on a 6-point Likert scale from 0 (strongly disagree) to 5 (Strongly agree). The scores of the 4 items were made a composite score with Cronbach's $\alpha = 0.71$. Higher scores indicate higher perception of COVID-19-related stigma.

*Perceived threat of COVID-19 to Nigerians.* The perceived threat of COVID-19 was measured using two statements that assessed the generally perceived seriousness, impact, and overall threat of COVID-19 to Nigerians. The first statement is: "the Coronavirus will not affect very many people in Nigeria". The second statement is: "the Nigerian government is exaggerating the health threat of COVID-19″. Participants indicated the degree to which they agree with the statements using a 6-point Likert scale from 0 (strongly disagree) to 5 (strongly agree). For the first statement, higher scores indicate higher perceived threat of COVID-19 to Nigerians. For the second statement, higher scores indicate lower perceived threat of COVID-19.

*Confidence in government.* Similar to the support for government's action above, we adapted two questions from Kennedy et al. [20] that surveyed Canadians' trust in their government's ability to fight the COVID-19. The two questions were: 1) "How much confidence do you have on federal government's ability to curtail the spread and impact of corona virus on Nigerians?" and 2) "How much confidence do you have on state government's ability to curtail the spread and impact of corona virus on the state?" The participants responded to the questions using a 6-point Likert scale from 0 (cannot be trusted at all) to 5 (can be trusted a lot) to show their confidence in the federal and state governments' ability to curtail the spread and impact of corona virus on Nigerians. Higher scores indicate higher confidence in the federal and state governments.

*Sociodemographic characteristics.* We included sociodemographic variables in the analyses: age, gender, marital status, years of education, subjective social standing, and town of residence (grouped by higher or lower reported COVID-19 cases). According to Nigeria center for Disease Control, Lagos, Kano, and Abuja have higher reported cases while other towns/cities have lower reported cases of COVID-19. In the study, the cut-off for towns with higher number of cases is over 400 [27]. Participants were also asked if they were sick in the last 6 months that required hospital visitation with a 'yes' or 'no' response.

*Data analytic strategy*

We conducted descriptive analyses to provide measure performance and a profile of the sample's sociodemographic characteristics. We also conducted two linear regression models to determine the associations between compliance with COVID-19 public health recommendations, support for government's action against COVID-19 spread, predictors of interest, and other covariates. All statistical analyses were conducted using SPSS version 23.0 (SPSS Inc., Chicago, IL) and R software, with a statistically significant p-value level of 0.05.

**Results**

*Demographics*

More than half of the sample ($n = 336$) were female (56.8%) and 42.6% of them were male. In terms of education, the mean years of education of participants was 16.31 years. Also, more than half (59.2) of the sample lived in towns/cities with lower number of reported cases while 40.8% lived in towns/cities with higher number of reported cases (see Table 1 for more demographic information of the sample). Furthermore, participants provided reasons why they may not comply with public health recommendations. They ranged from economic to religious reasons (see Table 2 for more information).

*Compliance with COVID-19 public health recommendations*

The reported results have statistically significant relationships in the regression model (see Table 3). Compared to Nigerian men, Nigerian women were more likely to adhere to COVID-19 public health recommendations ($\beta = 0.5440$). The women reported higher tendency of complying with public health directives pertaining to COVID-19 prevention and spread. Compared to Nigerians living in towns with lower COVID-19 reported cases, Nigerians living in towns with higher reported cases are more likely to adhere to the lockdown directives ($\beta = 0.3498$). Also, perceived risk of stigmatization if diagnosed with COVID-19 was found to predict compliance with lockdown directives ($\beta = 0.1053$); with those that reported increased perceived risk of stigmatization reporting higher tendency for compliance. Additionally, increase in the belief that the government is exaggerating the health threat of COVID-19 was associated with a decrease in compliance ($\beta = -0.0738$), and an increase in support for government's actions against COVID-19 was associated with a decrease in non-compliance with public health recommendations ($\beta = -0.1816$).

*Support for government's actions against COVID-19 spread*

The reported results have statistically significant relationships in the regression model. Compared to Nigerian men, Nigerian women were more likely to be in support for government's actions against COVID-19 spread in Nigeria ($\beta = 0.2276$). Compared to Nigerians living in towns with lower COVID-19 reported cases, those in towns with higher reported cases are more likely to support government's actions against COVID-19 spread in Nigeria ($\beta = 0.1817$). General risk perceptions were found to predict support for government's actions against COVID-19 spread. Increased perception that the virus will

**Table 1**
Characteristics of the COVID-19 study participants ($n = 336$).

|  | Frequency | Percent |
|---|---|---|
| Gender |  |  |
| Female | 143 | 42.6 |
| Male | 191 | 56.8 |
| Missing | 2 | 0.6 |
| Marital Status |  |  |
| Married | 154 | 45.8 |
| Living as married | 7 | 2.1 |
| Separated | 3 | 0.9 |
| Divorced | 6 | 1.8 |
| Single/Never Married | 166 | 49.4 |
| Presence of Children |  |  |
| Yes | 143 | 42.6 |
| No | 193 | 57.4 |
| Employment Status |  |  |
| Employed | 235 | 69.9 |
| Unemployed | 101 | 30.1 |
| Towns by caseload |  |  |
| Lower cases | 199 | 59.2 |
| Higher cases | 137 | 40.8 |
| Medical Insurance |  |  |
| Yes | 125 | 37.2 |
| No | 211 | 62.8 |

**Table 2**
Reasons provided for non-compliance with public health directives.

|  | Frequency |
|---|---|
| Economic reasons (e.g., money, work) | 150 |
| Social reasons (e.g., to hang out with friends and families) | 107 |
| Psychological reasons (e.g., boredom) | 106 |
| Religious reasons (e.g., to attend church or mosque service) | 46 |

affect many Nigerians was associated with increased support for government's actions against the spread of the disease ($\beta = 0.1022$). However, an increased perception that the government is exaggerating the health threat of the virus was associated with a decreased support for government's actions against the spread of the disease ($\beta = -0.0984$). Also, increased confidence in the state government's ability to curtail the spread and impact of COVID-19 was associated with an increased support for government's actions against the spread of the disease ($\beta = 0.0891$). See Table 4 for results.

**Table 3**

Linear regression showing factors associated with compliance with COVID-19 public health recommendations among Nigerians ($N = 329$).

|  | Estimate | SE | Pr(>|t|) |
|---|---|---|---|
| Age | 0.0049 | 0.0086 | 0.5721 |
| Gender (Ref = Male) |  |  |  |
| Female | 0.5440 | 0.0086 | 1.35e-07*** |
| Education in years | −0.0329 | 0.0384 | 0.3925 |
| Marital Status (Ref = Married) |  |  |  |
| Partnered | 0.1029 | 0.3279 | 0.7539 |
| Separated | −0.7504 | 0.4955 | 0.1309 |
| Divorced | −0.1299 | 0.3604 | 0.7188 |
| Single | −0.0442 | 0.1477 | 0.7651 |
| Have Kids (Ref = Yes) |  |  |  |
| No | −0.1123 | 0.1521 | 0.4608 |
| Employment (Ref = Yes) |  |  |  |
| No | −0.0220 | 0.1150 | 0.8482 |
| Town (Ref = lower cases) |  |  |  |
| Higher cases | 0.3498 | 0.0987 | 0.0005*** |
| Medical Insurance (Ref = Yes) |  |  |  |
| No | 0.0306 | 0.1092 | 0.7798 |
| Stigma | 0.1053 | 0.0491 | 0.0327* |
| Many will be affected | 0.0026 | 0.0319 | 0.9348 |
| Threat is exaggerated | −0.0738 | 0.0313 | 0.0193* |
| Support for Govt.'s Actions | 0.1713 | 0.0531 | 0.0014** |

Notes: * = p < .05, ** = p < .01, *** = p < .001, SE = Standard Error.

## Discussion

This study explored factors that may influence compliance with COVID-19 public health directives and support for government actions against the disease. Our findings show that Nigerian women were more likely to comply with COVID-19 public health measures than Nigerian men. These findings may not be surprising considering that men are more likely than women to adopt risky health behaviours [29, 30, 44]. Research suggests that identification with masculinity ideologies promotes risky health behaviours [13, 14]. Research shows that men in Nigeria have higher masculinity tendencies than women due to socialization, negative perception of men that exhibit feminine tendencies, and the social repercussion for men who do not appear tough or act tough [29, 30]. In our study, gender difference was also evident in the degree to which Nigerians support the government's actions against COVID-19 and subsequent compliance with lockdown directives. Nigerian women were more likely to support these government actions than the men. It is possible that COVID-19 lockdown directives limit perceived autonomy and individuality, and these limitations are frowned upon by some men (Himmelstein & Sanchez, 2014; [24]).

Another illuminating finding from the current study is the higher compliance rate among Nigerians living in towns with higher reported cases of COVID-19. This may suggest that awareness or knowledge of the impact of COVID-19 promotes increased compliance with COVID-19 public health recommendations. In this study, the cities/towns with higher cases (Lagos, Kano, and Abuja) are more equipped with better information and communication infrastructures. In these cities, there is likely more access to health information (e.g., through the use of social media) which helps combat public health crisis [31, 46] such as the COVID-19 outbreak. More so, as the COVID-19 cases increase, so is the tendency to support government's actions towards curtailing the spread and impact of COVID-19. Hence, our finding that those in cities with higher COVID-19 cases are more likely to support government's action than those in towns with lower cases. Given that the cities with higher cases are also densely populated, more cases may overburden a fragile health system in terms of providing sufficient supplies of facilities for infection prevention and control [34].

The study also explored the effect of perceived stigma on compliance with COVID-19 health directives. There are several studies on the threat of disease-related stigma on individuals ([4]; Crapanzano et al., 2019; [22, 41]) including those who work with people with COVID-19 [7, 37]. Stigma is shaped not only by the disease characteristics but also by the social and

**Table 4**

Linear regression showing factors influencing support for government's actions against COVID-19 spread among Nigerians ($N = 329$).

|  | Estimate | SE | Pr(>|t|) |
|---|---|---|---|
| Age | 0.0119 | 0.0088 | 0.1784 |
| Gender (Ref = Male) |  |  |  |
| Female | 0.2276 | 0.1036 | 0.0288** |
| Years of Education | −0.0096 | 0.0394 | 0.8087 |
| Marital Status (Ref = Married) |  |  |  |
| Partnered | 0.1622 | 0.3406 | 0.6342 |
| Separated | −0.0987 | 0.5139 | 0.8479 |
| Divorced | −0.0291 | 0.3743 | 0.9382 |
| Single | −0.2027 | 0.1523 | 0.1842 |
| Have Kids (Ref = Yes) |  |  |  |
| No | 0.1434 | 0.1578 | 0.364 |
| Employment (Yes) |  |  |  |
| No | 0.0494 | 0.1130 | 0.6625 |
| Town (Ref = lower case) |  |  |  |
| Higher cases | 0.1817 | 0.1022 | 0.0764* |
| Sick 6 months ago (Ref = Yes) |  |  |  |
| No | 0.1089 | 0.1268 | 0.3910 |
| Many will be affected | 0.1022 | 0.0334 | 0.0024*** |
| Threat is exaggerated | −0.0984 | 0.0319 | 0.0022*** |
| Confidence in Federal Govt. | 0.0558 | 0.0497 | 0.2631 |
| Confidence in State Govt. | 0.0891 | 0.0477 | 0.0625* |

Notes: * = p < .05, ** = p < .01, *** = p < .001, SE = Standard Error.

institutional processes linked to discrimination, hostility and social disharmony [9]. This may help explain the association between perceived risk of COVID-19 stigma and increased compliance with public health directives found in the study. People who believe there is risk of stigma from COVID19 may comply with corresponding public health directives to prevent the resulting stigma. This finding likely contradicts Mackolil and Mackolil's [23] study which identified COVID-19-related stigmatization as a reason for noncompliance with public health recommendations.

Another influencing factor identified in the study is that increased perception that the Nigerian government is exaggerating the health threat of COVID-19 results in non-compliance with public health recommendations, and decreased support for government's actions. Research suggests that exaggerated or excessive information about COVID-19 can appear overwhelming — causing sadness, fear, shock, and situations where people blame and shame the government for dishonesty [28]. Sometimes, exaggerated information may be viewed by the citizens as an act of politicizing the COVID-19 pandemic [39] leading to poor response to government driven public health directives and actions. In some cases, perceptions that COVID-19 information and corresponding measures are exaggerated may result in civil unrest and reduced compliance with infection prevention and control recommendations [53].

Furthermore, if there are strict enforcement of the COVID-19 measures, some people may become resistant to the enacted measures [3]. Conversely, the increased perception that the virus could affect many Nigerians is associated with increased support for the government's actions to curb the spread and impact of the disease. Perception helps individuals to develop self-awareness of their environment and by admitting the potency of the risk of COVID-19 threat, some Nigerians may experience heightened responsiveness and willingness to do what is needed (e.g. compliance) to be safe or survive [28]. Overall, there is need to ensure appropriate knowledge and awareness on COVID-19 are increased in Nigeria. For example, COVID-19 knowledge and awareness can be improved through empathic and effective communication by the government and public health leaders [33]. This may also help increase citizens trust regarding public health and the government's actions.

However, the level of trust and confidence in the government has not been encouraging in Nigeria. About 30% of Nigerians in the 2016/2018 Afrobarometer survey do not trust the president, while 25% trust him a little, and about 59% also reported no or low trust in the state governor [1]. These indications of low or no trust by the people may help explain the low confidence in government found in our study. We found that over 70% of the participants had low confidence in the

federal government's ability to curtail the spread and impact of COVID-19. Also, over 60% of the sample had low confidence in the state government's ability to curb the spread and impact of COVID-19.

As expected, increased support for government's efforts against COVID-19 is associated with increased compliance with COVID-19 public health guidance in the study. This is likely because support for government's actions against COVID-19 spread and impact is an indication of public trust which is important for achieving public health outcomes [12, 45]. Trust in government is inextricably linked to effective communication of crisis and emergency risks, antecedent improvements in health and social service deliveries, and public perception of government's handling of previous public health emergencies. This is further strengthened by the study's result which demonstrated that increased confidence in the state government's ability to contain the spread and impact of the disease is associated with increased support for government's actions against the disease. Relatedly, low confidence in government hinders the success of health recommendations during a public health crisis [12] because adoption of health behaviours by the public depend on trust in the government [36]. Overall, the importance of political systems in determining the success of public health campaigns cannot be overemphasized. For example, in a national public health intervention where trust in the government was low, there was reported decrease in vaccination of children [25].

## Limitation and implications

The current study is not without certain limitations. Due to the non-random sampling method and the size of the sample, care should be taken regarding generalizing the findings to the Nigerian population. The data was collected via online survey and this exempted key members of the Nigerian population who do not have access to the internet but are experiencing the devastating impact of COVID-19. Furthermore, the urgency of the study resulted in the survey being open for participation for only two weeks. Perhaps, leaving it for a longer period would have resulted in more responses from Nigerians.

Despite the limitations, the study findings are relevant to policymakers and other key stakeholders in the fight against COVID-19 in Nigeria. Given its weak health care system and high level of poverty, there is a high need to ensure the public health responses to the pandemic are effective and contextually relevant. Furthermore, Nigerians will benefit from research on the effect of the government sanctioned COVID-19 public health directives on quality of life of Nigerians given the issues of non-compliance and support discussed in the study.

## Conclusion

In response to any pandemic, public health experts and the government must work collaboratively to develop infection-control directives and actions to combat the transmission of the infection. This study examined some of the factors that are associated with COVID-19 compliance with public health directives and support for Nigerian government's actions to curb the spread. To the best of our knowledge, this study is the first of its kind in Nigeria and sub-Saharan Africa. Factors such as gender, education, town of residence, stigma, perceived threat, and confidence in government are important factors that may influence compliance with public health directives. While COVID-19 is unprecedented and remains inadequately understood especially in Nigeria, this study helps to inform policymakers and implementers on factors that are important to consider when combating the spread of COVID-19.

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## Declaration of Competing Interest

The authors declare no conflict of interest in the study.

## Appendices

Result Tables

## References

[1] Afrobarometer (2021). The online data analysis tool: afrobarometer (R7 2016/2018). Retrieved May 4, 2021, from https://afrobarometer.org/online-data-analysis/analyse-online

[2] A. Aliyu, L. Amadu, Urbanization, cities, and health: the challenges to Nigeria - a review, Ann. African Med. 16 (4) (2017) 149–158, doi:10.4103/aam.aam_1_17.

[2] Briscese, G., Lacetera, N., Macis, M., & Tonin, M. (2020). Compliance with COVID-19 social-distancing measures in Italy: the role of expectations and duration. Retrieved May 20, 2020, from https://www.nber.org/papers/w26916.pdf

[4] [4] M. Çapar, F. Kavak, Effect of internalised stigma on functional recovery in patients with schizophrenia, Perspect. Psychiatr. Care 55 (1) (2019) 103–111.

[5] Cascella, M., Rajnik, M., Cuomo, A., Dulebohn, S.C., & Napoli, R., Di. (2020). Features, evaluation and treatment coronavirus (COVID-19). Retrieved May 20, 2020, from https://www.ncbi.nlm.nih.gov/books/NBK554776/

[6] K.A. Crapanzano, R. Hammarlund, B. Ahmad, N. Hunsinger, R. Kullar, The association between perceived stigma and substance use disorder treatment outcomes: a review, Substance Abuse Rehab. 10 (2018) 1–12, doi:10.2147/SAR.S183252.

[7] M.F. Chersich, G. Gray, L. Fairlie, Q. Eichbaum, S. Mayhew, B. Allwood, F. Scorgie, S. Luchters, G. Simpson, M.M. Haghighi, COVID-19 in Africa: care and protection for frontline health-care workers, Global. Health 16 (1) (2020) 1–6.

[8] CityLab. (2020). *What we know about density and covid-19's spread*. Retrieved May 12, 2020, from https://www.citylab.com/equity/2020/04/coronavirus-spread-map-city-urban-density-suburbs-rural-data/609394/

[9] Das, M. (2020). Social construction of stigma and its implications–observations from COVID-19. Retrieved from http://dx.doi.org/ 10.2139/ssrn.3599764

[10] N. van Doremalen, T. Bushmaker, D.H. Morris, M.G. Holbrook, A. Gamble, B.N. Williamson, … V.J. Munster, Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1, *New Engl. J. Med.* NLM (Medline) (2020), doi:10.1056/NEJMc2004973.

[11] European Centre for Disease Prevention and Control. (2020). COVID-19 situation update worldwide, as of 9 May 2020. Retrieved May 9, 2020, from https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases

[12] V.S. Freimuth, D. Musa, K. Hilyard, S.C. Quinn, K. Kim, Trust during the early stages of the 2009 H1N1 pandemic, J. Health Commun. 19 (3) (2014) 321–339, doi:10.1080/10810730.2013.811323.

[13] D.M. Gordon, S.W. Hawes, A.E. Reid, T.A. Callands, U. Magriples, A. Divney, L.M. Niccolai, T. Kershaw, The many faces of manhood: examining masculine norms and health behaviors of young fathers across race, Am. J. Men's Health 7 (5) (2013) 394–401, doi:10.1177/1557988313476540.

[14] D.M. Griffith, "I am a man": manhood, minority men's health and health equity, Ethn. Dis. 25 (3) (2015) 287–293, doi:10.18865/ed.25.3.287.

[15] M.S. Himmelstein, D.T. Sanchez, Masculinity impediments: internalized masculinity contributes to healthcare avoidance in men and women, J. Health Psychol. 21 (7) (2016) 1283–1292.

[16] J. Hsu, Population density does not doom cities to pandemic dangers, Sci. Am. (2020) Retrieved from https://www.scientificamerican.com/article/population-density-does-not-doom-cities-to-pandemic-dangers/ .

[17] A.S. Jegede, What led to the Nigerian boycott of polio vaccination campaign? PLoS Med. 4 (3) (2007) e73 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1831725/.

[18] Johns Hopkins Bloomberg School of Public Health (2020). *Study: urban density not linked to higher coronavirus infection rates—And is linked to lower COVID-19 death rates.* Retrieved from https://www.jhsph.edu/news/news-releases/2020/urban-density-not-linked-to-higher-coronavirus-infection-rates-and-is-linked-to-lower-covid-19-death-rates.html

[19] B. Kalu, COVID-19 in Nigeria: a disease of hunger, Lancet Respiratory Med. (2020) Retrieved from, doi:10.1016/S2213-2600(20)30220-4.

[20] Retrieved 6 April 2020 from E. Kennedy, J. Vikse, C. Chaufan, K. O'Doherty, C. Wu, Y. Qian, P. Fafard, Canadian COVID-19 social impacts survey - summary of results #1: risk perceptions, trust, impacts, and responses, Preprint (2020). Retrieved 6 April, 2020 from https://figshare.com/articles/Canadian_COVID-19_Social_Impacts_Survey_-_Summary_of_Results_1_Risk_Perceptions_Trust_Impacts_and_Responses/1212190 .

[21] Q. Li, X. Guan, P. Wu, X. Wang, L. Zhou, Y. Tong, … Z. Feng, Early transmission dynamics in Wuhan, China, of novel coronavirus–infected pneumonia, N. Engl. J. Med. 382 (13) (2020) 1199–1207, doi:10.1056/NEJMoa2001316.

[22] C.H. Logie, J.M. Turan, How do we balance tensions between COVID-19 public health responses and stigma mitigation? Learning from hiv research, AIDS Behav. (2020) 1–4 Advance online publication, doi:10.1007/s10461-020-02856-8.

[23] J. Mackolil, J. Mackolil, Addressing psychosocial problems associated with the COVID-19 lockdown, Asian J. Psychiatry 51 (102156) (2020), doi:10.1016/j.ajp.2020.102156.

[24] E.S. Mankowski, K.I. Maton, A community psychology of men and masculinity: historical and conceptual review, Am. J. Community Psychol. 45 (1–2) (2010) 73–86, doi:10.1007/s10464-009-9288-y.

[25] T. Miyachi, M. Takita, Y. Senoo, K. Yamamoto, Lower trust in national government links to no history of vaccination, Lancet 395 (10217) (2020) 31–32, doi:10.1016/S0140-6736(19)32686-8.

[26] L. Morawska, J. Cao, Airborne transmission of SARS-CoV-2: the world should face the reality, Environ. Int. 139 (2020) 105730, doi:10.1016/j.envint.2020.105730.

[27] [27]Nigeria Centre for Disease Control. (2020). *NCDC coronavirus COVID-19 microsite.*Retrieved May 9, 2020, from https://covid19.ncdc.gov.ng/

[28] [28]Nicomedes, C.J. & Avila., R. (2020). An analysis of the panic of Filipinos during COVID-19 pandemic in the Philippines. Retrieved 22 May 22, 2020, from https://doi.org/10.13140/RG.2.2.17355.54565

[29] C. Odimegwu, S. Pallikadavath, S. Adedini, The cost of being a man: social and health consequences of Igbo masculinity, Culture Health Sexuality 15 (2) (2013) 219–234.

[30] C. Odimegwu, C.N. Okemgbo, Men's perceptions of masculinities and sexual health risks in Igboland, Nigeria, Int. J. Men's Health 7 (1) (2008) 21–39, doi:10.3149/jmh.0701.21.

[31] O.O. Olagbaju, O.E. Awosusi, O.E. Shaib, COVID-19 Induced changes on lifestyles education and socio-economic activities in West African states: recovery strategies for post pandemic era, Int. J. World Policy Dev. Stud. 6 (4) (2020) 38–43.

[32] S. Ozawa, M.L. Stack, Public trust and vaccine acceptance - international perspective, Human Vaccines Immunother. 9 (8) (2013) *Retrieved 5 May from* https://www.tandfonline.com/doi/full/10.4161/hv.24961.

[33] [33]Pfattheicher, S., Nockur, L., Böhm, R., Sassenrath, C. & Petersen, M.B. (2020). The emotional path to action: empathy promotes physical distancing during the COVID-19 pandemic. Preprint. Retrieved May 19, 2020, from https://doi.org/10.31234/osf.io/y2cg5

[34] Retrieved 23 May 2020, from T. Powell-Jackson, J.J. King, C. Makungu, N. Spieker, S. Woodd, P. Risha, C. Goodman, Infection prevention and control compliance in Tanzanian outpatient facilities: a cross-sectional study with implications for the control of COVID-19, Lancet Global Health (2020). Retrieved 23 May, 2020, from, doi:10.1016/S2214-109X(20)30222-9.

[35] S.C. Quinn, S. Kumar, Health inequalities and infectious disease epidemics: a challenge for global health security, Biosecur. Bioterror. 12 (5) (2014) 263–273, doi:10.1089/bsp.2014.0032.

[36] S.C. Quinn, J. Parmer, V.S. Freimuth, K.M. Hilyard, D. Musa, K.H. Kim, Exploring communication, trust in government, and vaccination intention later in the 2009 H1N1 pandemic: results of a national survey, Biosecur. Bioterror. 11 (2) (2013) 96–106, doi:10.1089/bsp.2012.0048.

[37] T. Ramaci, M. Barattucci, C. Ledda, V. Rapisarda, Social stigma during COVID-19 and its impact on HCWs outcomes, Sustainability 12 (9) (2020) 3834.

[38] J. Riou, C.L. Althaus, Pattern of early human-to-human transmission of Wuhan 2019 novel coronavirus (2019-nCoV), December 2019 to January 2020, *Eurosurveillance*. European Centre for Disease Prevention and Control (ECDC) (2020) Retrieved from, doi:10.2807/1560-7917.ES.2020.25.4.2000058.

[39] [39]Rosenfeld, D.L., Rothgerber, H., & Wilson, T. (2020). Politicising the COVID-19 pandemic: ideological differences in adherence to social distancing. Retrieved May 19, 2020, from https://doi.org/10.31234/osf.io/k23cv

[40] M.A. Shereen, S. Khan, A. Kazmi, N. Bashir, R. Siddique, COVID-19 infection: origin, transmission, and characteristics of human coronaviruses, J. Adv. Res. 24 (2020) 91–98, doi:10.1016/j.jare.2020.03.005.

[41] R.A. Smith, X. Zhu, E.L. Fink, Understanding the effects of stigma messages: danger appraisal and message judgments, Health Commun. 34 (4) (2019) 424–436.

[42] [42]Akinwotu, E., & Burke, J. (2020). Deaths in Nigerian city raise concerns over undetected Covid-19 outbreaks | World news | The Guardian. Retrieved 9 May 2020, from https://www.theguardian.com/world/2020/apr/28/nigerian-authorities-deny-wave-of-deaths-is-due-to-covid-19

[43] I.S. Usuwa, C.O. Akpa, C.D. Umeokonkwo, M. Umoke, C.S. Oguanuo, A.A. Olorukooba, … M.S. Balogun, Knowledge and risk perception towards Lassa fever infection among residents of affected communities in Ebonyi State, Nigeria: implications for risk communication, BMC Public Health 20 (1) (2020), doi:10.1186/s12889-020-8299-3.

[44] I. Waldron, *Changing gender roles and gender differences in health behavior*, in: D.S. Gochman (Ed.), Handbook of Health Behavior Research 1: Personal and Social Determinants, Plenum Press, 1997, pp. 303–328.

[45] P.R. Ward, Improving access to, use of, and outcomes from public health programs: the importance of building and maintaining trust with patients/clients, Front. Public Health 5 (2017) 22 Retrieved May 20, 2020, from, doi:10.3389/fpubh.2017.00022.

[46] M.O. Welcome, The Nigerian health care system: need for integrating adequate medical intelligence and surveillance systems, J. Pharmacy Bioallied Sci. 3 (4) (2011) 470–478, doi:10.4103/0975-7406.90100.

[47] WHO. (2016). *World health statistics 2016: monitoring health for the SDGs*. Retrieved 10 May 2020, from https://books.google.co.uk/books?hl=en&lr=&id=-A4LDgAAQBAJ&oi=fnd&pg=PP1&ots=dbplZUcnvA&sig=AreMggzViB5V74Bteft3FxEwa2Y&redir_esc= y#v=onepage&q&f=false

[48] [48]WHO. (2020a). *WHO | disease outbreaks by year*. Retrieved 8 May 2020, from https://www.who.int/csr/don/archive/year/en/

[49] [49]WHO (2020b). *New WHO estimates: up to 190 000 people could die of COVID-19 in Africa if not controlled*. Retrieved 14 May 2020, from https://www.afro.who.int/news/new-who-estimates-190-000-people-could-die-covid-19-africa-if-not-controlled

[50] [50]WHO (2020c). *Coronavirus disease (COVID-19) Situation Report–143*. Retrieved 7 June 2020, from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200611-covid-19-sitrep-143.pdf?sfvrsn=2adbe568_4

[51] [51]World Bank (2020). Literacy rate, adult total (% of people ages 15 and above). Retrieved 5 May from https://data.worldbank.org/indicator/SE.ADT.LITR.ZS

[52] [52]Worldometer (2020). *United States Coronavirus: 1,405,915 Cases and 83,280 Deaths - Worldometer*. Retrieved 12 May 2020, from https://www.worldometers.info/coronavirus/country/us/

[53] [53] Y. Xiao, M.E. Torok, Taking the right measures to control COVID-19, Lancet Infect. Dis. 20 (5) (2020) 523–524.

[54] X. Yu, R. Yang, COVID-19 transmission through asymptomatic carriers is a challenge to containment, Influenza Other Respir. Viruses (2020), doi:10.1111/irv.12743.