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RESEARCH ARTICLE

Compliance with Lockdown Regulations During the COVID-19 Pandemic in South Africa: Findings from an Online Survey

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Abstract:

Background:

Background: SARS-CoV-2 has resulted in the COVID-19 pandemic. Based on a nationally representative online survey conducted several weeks on the pandemic, this paper explores how South Africans responded to the compliance regulations laid down by the national government and factors associated with individuals' confidence in their community adhering to lockdown regulations.

Methods:

The study was conducted using a closed-ended questionnaire on a data-free online platform. Additionally, a telephonic survey was included to accommodate individuals who do not have access to smart-phones. The study population consisted of respondents who were 18 years and older and living in South Africa (n=19 933). Data were benchmarked to the 2019 midyear population estimates. Descriptive statistics and bivariate logistic regression are presented.

Results:

Over a quarter (26.1%) of respondents reported that they had not left home, indicating compliance with the COVID-19 control regulations, and 55.3% who did leave their homes did so to purchase essential items. A small proportion (1.2%) reported that they had visited friends. People, classified as coloured, those who were more literate (those with secondary, matric and tertiary education status), those residing in disadvantaged areas (informal settlements, townships, rural areas and farms), and those who perceived their risk of contracting COVID-19 as moderate and high, reported not being confident of their community adhering to lockdown.

Conclusion:

Communication strategies must be employed to ensure that important information regarding the pandemic be conveyed in the most important languages and be dispatched via various communication channels to reach as many people as possible.

Keywords: Lockdown, Compliance, South Africa, Community, COVID-19, Adherence.

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1. BACKGROUND

COVID-19 is a rapidly advancing pandemic, caused by a novel coronavirus (SARS-CoV-2), affecting populations across the globe [1]. It began in December 2019, when Wuhan City, China, became the site of a respiratory epidemic of unknown causes, which drew significant interest not only inside China but also globally. On 30th January 2020, the World Health Organization (WHO) declared the novel coronavirus outbreak, now known as COVID-19, as a "Public Health Emergency of International Concern (PHEIC)." This initiated greater concern

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and the need for enhanced preparedness in response to such an epidemic, and a month later, WHO reclassified COVID-19 as a global pandemic [2]. The concern of an outbreak in the African continent rose, as the already overwhelmed and fragile health systems would not handle an outbreak of this severity and nature [3]. As the COVID-19 outbreak swept across the African continent, health authorities and governments began taking swift actions as part of the efforts to slow the pandemic, flatten the curve and prepare the already overburdened health systems for the rise in cases [3]. Of further concern is that to date, there has been no explicitly recommended viral treatment or vaccine for COVID-19. It is in this context that governments around the world, prompted by the WHO, began taking steps that were, and remain, unprecedented in modern times to prevent a total catastrophe. Thus, the application of preventative measures in the quest to control COVID-19 became a crucial intervention. This led to curfews and lockdowns to contain the spread of the virus. Lockdowns resulted in the closure of schools, tertiary institutions, businesses, food outlets, religious places of worship, land, sea and air borders, all sporting activities, with only essential service businesses and medical facilities allowed to operate [4, 5]. Within the first three months of COVID-19 infections, a third of the global population faced lockdown.

South Africa (SA), having the highest number of cases in sub-Saharan Africa, has worked hard to optimize the state of preparedness in response to COVID-19. As part of the efforts to minimize the spread of COVID-19 and promote social distancing, the South African president declared a national state of disaster and announced a three-week "hard" lockdown (later known as level 5) beginning at midnight of 26th March 2020 [6]. Based on the known evidence that the disease had a 14-day incubation period during which symptoms of infection could manifest themselves, the three-week lockdown was a deliberate intervention to break the rate at which transmissions could occur. This lockdown period resulted in the closure of schools, mass gatherings of 100 or more people were prohibited, suspension of visits to correctional facilities, ceasing of business and other entity operations, the prohibition of commuter transport services except for essential services, local and international travel bans, and border closures except for cargo, fuel and goods transportation [7]. There was also deployment of military forces to assist the police in managing the imposed lockdown to ensure people's compliance. After the initial lockdown, there was a subsequent extension of a further two-week period (until April 30th).

When the full or "hard" lockdown was announced, reactions were mixed. They included support for the strategy to delay the peak of COVID-19 to a cavalier attitude to the lockdown restrictions. Many, as the survey results show, welcomed the development of the SA government's five-stage countrywide lockdown strategy that aimed to mitigate further viral exposure and containment in an effort to prevent pandemic hotspots and further threats to the already overwhelmed health system to ensure flattening of the curve. This swift action also received global praise for promoting public health measures in the absence of a vaccine or explicit COVID-19 treatment. This saw the rapid development of a sense of camaraderie among South Africans in the hope of them staying at home to minimize physical contact and viral spread. To ensure lockdown compliance, the government deployed South African National Defence Force (SANDF) personnel to assist the police. The use of law enforcement during lockdown was vital to ensure people were restricted from travelling within their communities except for food, medicines and other essential commodities and managing the 8pm to 5am curfew [8].

The Human Sciences Research Council in South Africa conducted an online quantitative survey to gain an understanding of the South African public's knowledge, attitudes and behaviours in response to the national lockdown during the COVID-19 pandemic. This paper aims to explore South Africans' compliance with lockdown utilizing data from a rapid online survey. It further explores factors associated with individuals' confidence in their community adhering to lockdown regulations.

2. METHODS

2.1. Study Design and Sampling

Movement restrictions implemented during the COVID-19 lockdown meant that face-to-face interview methods were not feasible. An online survey method, supplemented by telephonic surveys, was employed. The online survey was conducted during the period 8 to 23 April 2020. In order to represent people from townships and informal settlement areas, an additional random sample of people residing in these locations was contacted directly via telephone to respond to the questionnaire during 8 to 29 April 2020. The study sample included South African adults (≥18 years).

2.2. Study Procedures

The request for participation in the survey was widely disseminated using various social media and communication channels. The Moya Messaging platform was selected for the distribution of the survey due to its data-free classification and its extensive user-base of four million members and one million daily-engaged users nationally. This messaging platform allows anyone with a mobile phone to respond to the survey, irrespective of data in their mobile phone account or available airtime, thus making it free of charge for the end user. The platform comprises 99.5% South African citizens, 20% public servants and 53% female, with younger users being the greater proportion. An average monthly income (92%) of the users is below R15 000 ($828). Additionally, communication alerts for participation in the survey were disseminated widely via social media, websites, WhatsApp and email.

Press statements were released to invite and inform the public about the survey and social influencers promoted survey participation on social media and national and regional radio stations. All participants were encouraged to share the survey web links. The links included a standard link and another link for mobile phone users to access the survey without any costs. This method permitted the survey to reach South Africans across the wider economic spectrum. Participation in the survey was voluntary and personal information was not required as part of the response. All Internet Protocol (IP)

addresses were delinked from the data prior to analysis. However, IP addresses limited the number of times a user could complete the survey using a specific device/user account. All participants were requested to provide electronic informed consent. Thereafter, they were informed of their voluntary participation, the option to withdraw at any point and the anonymity of their responses. The average survey completion time was 15-20 minutes. Trained interviewers captured the survey responses on behalf of telephonic participants.

2.3. Study Instrument

The questionnaire was designed through consultative processes with public health scientists, epidemiologists and behavioural science researchers. The development of the questionnaire was informed by recent work on public reactions and opinions to the COVID-19 pandemic [9, 10]. Subject areas in the questionnaire included general knowledge of COVID-19, self-efficacy, perceived risk, travel and movement/physical distancing, access to food, water, healthcare and medicines, compliance with lockdown regulations, socio-economic and household impact of the virus, experiences with law enforcement and gender-based violence. The questionnaire consisted of 55 closed-ended questions, and was available in English and four of the most commonly spoken South African languages (Afrikaans, Sepedi, isiZulu and isiXhosa). This paper focuses on the questions on compliance with lockdown regulations.

2.4. Measures

2.4.1. Compliance During Lockdown

Compliance with lockdown regulation was measured using three main variables. Firstly, the ability to remain at home during lockdown based on the question "Have you been able to stay at home during the lockdown?" with the following responses; I have been at home since the start of lockdown and have not left I have had to leave to get food and medicine=1; I had to leave to collect a social grant=2; I spent a lot of my time visiting my friends and neighbours and socialising=3; not applicable I am an essential services worker=4. Secondly, people's confidence of their family, neighbours and community adhering to lockdown based on the following questions 1) "I am confident that my family and I are adhering to the order for lockdown and self-isolation"; 2) "I am confident that my neighbours are adhering to the order for lockdown and self-isolation"; and 3) "I am confident that my community are adhering to the order for lockdown and self-isolation", with response options being 1=strongly agree, 2=agree, 3= neutral, 4=disagree and 5=strongly disagree for each. These responses were regrouped into 1=disagree (disagree and strongly disagree), 2=neutral and 3=agree (agree and strongly agree).

2.4.2. Primary Outcome

Confidence in family and neighbours' adherence to regulations was very high, while confidence in community adherence to lockdown order was much lower. Therefore, the factors associated with confidence in community adherence were furthered explored. The three response options, 1=disagree (disagree and strongly disagree), 2=neutral and 3=agree (agree and strongly agree) were categorised into a dichotomised primary outcome 0=not agree (neutral and disagree) and 1=agree (agree).

2.4.3. Explanatory Variables

Explanatory variables were socio-demographic variables such as sex (male or female), age in years (18-29, 30-39, 40-49, 50-59, 60+), population group (Black African, Coloured, White, Indian/Asian), education level (none/primary, secondary, matric, tertiary), employment status (employed or unemployed), and community type (city, suburb, township, informal settlement, rural/traditional tribal area, farm).

Knowledge about methods to prevent COVID-19 transmission, agreement with staying home being necessary to prevent the spread of the virus and risk perception were also considered as explanatory variables. To assess knowledge, the following statement was considered, "I can prevent myself from becoming infected with the Corona virus (COVID-19) by: Washing my hands frequently for 20 seconds; Not touching my nose, eyes and face; Staying away from people who are infected; Wearing a mask; Drinking a lot of water; and Staying 2 meters away from another person" with response options being 1=yes, 2=no and 3=don't know. The responses to these six items were used to create a knowledge sum score ranging from 1 to 6, where 1 was assigned to each correct response. These were further recorded into three groups, 1=low (score of 1, 2, 3, 4), 2=moderate (score of 5), 3=high (score of 6).

The statement "Staying at home is necessary to curb the spread of COVID-19 virus" was presented to respondents with response options being 1=strongly agree, 2=agree, 3= neutral, 4=disagree and 5=strongly disagree. These responses were further regrouped into 1=disagree (disagree and strongly disagree), 2=neutral and 3=agree (agree and strongly agree). Risk perception was assessed using the question "How do you rate your personal risk of contracting COVID-19?" with response options being 1=very high risk, 2=high risk, 3=moderate risk, 4=low risk and 5= very low risk. These responses were recoded into 1=low risk (very low risk, and low risk), 2=moderate risk and 3=high risk (very high risk and high risk).

2.4.4. Statistical Analysis

Data were benchmarked using Statistics South Africa 2019's mid-year adult population estimates for generalisability of the findings to the country and to minimise bias due to the nature of the study [11]. Data analysis was performed with Stata version 15.0 [12]. Descriptive statistics with unweighted frequencies and weighted percentages were presented. Differences in compliance across the socio-demographic variables were compared using 95% Confidence Intervals (CIs) and the Chi-square test. Multiple logistic regression analysis was performed to determine factors associated with confidence in community adherence to lockdown regulations. Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CIs) and a p-value less than 0.05 were considered statistically significant.

3. RESULTS

3.1. Background Characteristics of Respondents

The study sample used for this paper was 19 933 respondents. After benchmarking, females constituted 52.1% and the black African population group accounted for 78.4% of the sample. About 32% were 18-29 years old, 43% had tertiary education, 35.3% resided in townships and 28.0% resided in the Gauteng Province (Table **1**).

Table 1. Socio-demographic characteristics of the study sample.

-	Sample	Weighted %	95% CI
Total	**19,933**	**100**	-
	-	-	-
Sex	-	-	-
Female	12,004	52.1	[51.1-53.1]
Male	7,693	47.9	[46.9-48.9]
Population group	-	-	-
Black African	10,110	78.4	[77.8-78.9]
White	6,408	9.6	[9.3-10.0]
Coloured[1]	2,314	9.0	[8.6-9.4]
Indian/Asian	1,101	3.0	[2.8-3.2]
Age group	-	-	-
18-29	6,784	31.5	[30.7-32.3]
30-39	5,599	25.9	[25.1-26.7]
40-49	3,637	17.0	[16.3-17.7]
50-59	2,241	12.1	[11.4-12.8]
60+	1,539	13.6	[12.6-14.6]
Education	-	-	-
None/Primary	664	6.0	[5.4-6.6]
Secondary	2,810	15.4	[14.7-16.1]
Matric	6,938	35.1	[34.1-36.0]
Tertiary	9,521	43.6	[42.6-44.6]
Employment	-	-	-
Employed full time	7,874	35.6	[34.7-36.5]
Employed informal/part time	1,968	10.1	[9.6-10.7]
Student	1,634	8.1	[7.6-8.5]
Unemployed	6,327	37.7	[36.7-38.7]
Self employed	2,130	8.5	[7.9-9.1]
Community type	-	-	-
City	2,749	10.2	[9.6-10.7]
Suburb	7,926	27.2	[26.4-28.1]
Township	4,959	35.3	[34.4-36.2]
Informal settlement	762	4.6	[4.2-5.0]
Rural (Traditional tribal area)	2,829	20.6	[19.8-21.4]
Farm	708	2.1	[1.9-2.4]
Province	-	-	-
Western Cape	3,839	12.4	[12.1-12.8]
Eastern Cape	1,634	10.5	[10.0-11.0]
Northern Cape	297	2.1	[2.0-2.3]
Free State	741	4.9	[4.6-5.2]
KwaZulu-Natal	3,530	18.3	[17.8-18.7]
North-West	614	6.7	[6.4-7.1]
Gauteng	6,547	28.0	[27.5-28.6]
Mpumalanga	1,922	7.6	[7.3-8.0]
Limpopo	809	9.4	[8.9-9.9]

[1]'Coloured' is a constructed racial category, similar to 'white' and 'black' designated onto South Africans during the system of legislated racial segregation. Sub-totals are not always equal to the overall total due to non-response or missing data. CI = Confidence Interval.

3.2. Compliance with the Lockdown Regulations

Table **2** summarises the reported ability of respondents to remain at home during the lockdown and reasons they may have had to leave home by socio-demographic characteristics. Overall, about a quarter (26.1%) of respondents indicated that they did not leave home at all during the lockdown period. Just above half (55.3%) reported that they left home to purchase essential items. Only 6.2% of respondents indicated that they left home to collect social grants. A very small proportion (1.2%) of respondents indicated that they visited friends during lockdown, and 11% reported that they were essential workers.

Table 2. Respondents' reported ability to remain home during lockdown by socio-demographic characteristics.

	Sample	I have been at home since the start of lockdown, and have not left		I have had to leave to get food and medicine		I had to leave to collect a social grant		I spend a lot of my time visiting my friends and neighbours and socialising		Not applicable - I am an essential services worker	
Characteristics	**n**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Total	**15,536**	**26.1**	**[25.1-27.1]**	**55.3**	**[54.2-56.5]**	**6.2**	**[5.6-6.9]**	**1.2**	**[1.0-1.5]**	**11.1**	**[10.4-11.8]**
Female	9,618	27.1	[25.8-28.4]	54.4	[52.9-55.8]	8.1	[7.3-8.9]	0.6	[0.4-0.9]	9.9	[9.1-10.7]
Male	5,762	25.0	[23.4-26.6]	56.5	[54.6-58.3]	4.1	[3.2-5.2]	1.9	[1.5-2.4]	12.6	[11.4-13.8]
Population group											
Black African	7,520	27.7	[26.5-29.0]	53.1	[51.7-54.5]	6.9	[6.2-7.8]	1.4	[1.1-1.7]	10.8	[10.0-11.7]
White	5,600	18.3	[16.9-19.8]	70.2	[68.5-71.8]	1.2	[0.8-1.6]	0.1	[0.1-0.3]	10.2	[9.3-11.2]
Coloured	1,543	20.5	[18.2-22.9]	55.7	[52.7-58.6]	8.0	[6.6-9.6]	1.2	[0.7-1.8]	14.7	[12.8-16.9]
Indian/Asian	873	28.2	[24.6-32.2]	57.6	[53.5-61.7]	1.7	[0.7-4.2]	0.2	[0.0-0.6]	12.3	[10.0-15.1]
Age group											
18-29	4,617	33.6	[31.9-35.3]	50.3	[48.5-52.0]	7.0	[6.2-8.0]	2.4	[1.9-3.0]	6.8	[6.0-7.7]
30-39	4,384	25.2	[23.6-26.9]	54.1	[52.2-55.9]	6.4	[5.5-7.4]	0.9	[0.6-1.3]	13.4	[12.2-14.8]
40-49	3,098	20.3	[18.4-22.3]	58.8	[56.4-61.2]	3.5	[2.8-4.5]	1.0	[0.6-1.7]	16.3	[14.6-18.2]
50-59	1,973	20.8	[18.2-23.7]	60.5	[57.1-63.8]	2.6	[1.8-3.8]	0.5	[0.2-1.5]	15.6	[13.2-18.4]
60+	1,375	26.0	[22.4-30.0]	57.6	[53.2-61.9]	10.7	[8.0-14.1]	0.5	[0.2-1.5]	5.2	[3.7-7.3]
Education											
None/Primary	511	41.3	[35.8-47.0]	38.2	[32.8-44.0]	13.2	[9.6-17.8]	3.4	[1.9-6.2]	3.9	[2.4-6.3]
Secondary	1,922	31.1	[28.3-34.1]	46.9	[43.8-50.0]	12.0	[10.0-14.3]	1.6	[1.0-2.4]	8.5	[6.9-10.3]
Matric	5,148	26.3	[24.8-28.0]	53.6	[51.7-55.5]	7.6	[6.5-8.9]	1.5	[1.1-1.9]	11.0	[9.8-12.4]
Tertiary	7,955	22.4	[21.0-23.8]	61.4	[59.8-63.1]	2.6	[2.1-3.3]	0.6	[0.4-0.9]	13.0	[11.9-14.1]
Employment status											
Employed	9,668	20.4	[19.3-21.6]	57.8	[56.4-59.2]	2.0	[1.6-2.5]	0.7	[0.5-1.0]	19.0	[17.9-20.2]
Unemployed	5,868	33.2	[31.4-35.0]	52.3	[50.4-54.2]	11.5	[10.2-12.8]	1.8	[1.4-2.3]	1.3	[1.0-1.8]
Community type											
City	2,127	26.7	[23.8-29.9]	55.7	[52.3-59.0]	2.8	[2.0-4.1]	0.3	[0.1-0.8]	14.4	[12.1-17.1]
Suburb	6,657	21.8	[20.1-23.6]	63.8	[61.8-65.8]	2.1	[1.5-2.9]	0.3	[0.2-0.5]	11.9	[10.7-13.3]
Township	3,396	25.0	[23.4-26.8]	53.3	[51.3-55.3]	8.2	[7.0-9.6]	1.3	[1.0-1.8]	12.1	[10.9-13.5]
Informal settlement	500	25.2	[21.1-29.9]	51.9	[46.8-57.0]	12.2	[9.6-15.4]	2.0	[1.1-3.8]	8.6	[6.2-11.8]
Rural (Traditional tribal area)	2,307	33.9	[31.3-36.5]	47.1	[44.3-49.9]	9.5	[7.9-11.3]	2.3	[1.6-3.2]	7.3	[6.0-8.7]
Farm	549	22.5	[17.8-28.1]	58.3	[51.2-64.9]	3.8	[2.0-7.1]	2.5	[0.7-8.3]	12.9	[8.9-18.4]
Province											
Western Cape	2,925	22.1	[20.1-24.2]	60.0	[57.5-62.5]	4.6	[3.8-5.6]	0.6	[0.3-1.0]	12.7	[11.0-14.7]
Eastern Cape	1,256	19.0	[16.2-22.2]	61.4	[57.2-65.3]	6.0	[3.8-9.3]	1.6	[0.9-2.7]	12.0	[9.9-14.5]
Northern Cape	200	15.0	[10.2-21.5]	54.8	[46.0-63.2]	9.0	[5.4-14.5]	1.7	[0.6-5.2]	19.6	[13.2-28.0]
Free State	556	19.4	[15.2-24.5]	57.3	[51.5-62.8]	6.8	[4.3-10.5]	1.1	[0.5-2.5]	15.4	[11.9-19.7]
KwaZulu-Natal	2,708	29.3	[27.1-31.6]	52.9	[50.4-55.4]	6.9	[5.5-8.8]	1.1	[0.8-1.6]	9.8	[8.5-11.2]
North-West	433	25.0	[19.5-31.4]	53.8	[47.6-60.0]	5.5	[3.7-8.3]	2.0	[0.9-4.6]	13.6	[9.8-18.5]
Gauteng	5,141	25.7	[24.1-27.3]	57.7	[55.9-59.5]	4.5	[3.8-5.5]	0.8	[0.6-1.2]	11.2	[10.2-12.4]
Mpumalanga	1,692	33.5	[30.2-37.1]	46.0	[42.5-49.4]	11.3	[9.1-14.0]	2.3	[1.5-3.8]	6.9	[5.4-8.6]
Limpopo	625	33.3	[28.8-38.1]	49.8	[44.6-55.0]	6.8	[4.6-10.2]	1.0	[0.4-2.5]	9.1	[6.6-12.4]

Sub-totals are not always equal to the overall total due to non-response or missing data. CI = Confidence Interval.

More than a quarter of Indian (28.2%) and black African (27.7%) population group respondents reported that they had not left home during the lockdown compared to less than one-fifth (18.3%) of white respondents. A significantly larger proportion of respondents from the White population group (70.2%) indicated that they left home to procure essential items, compared to just over half of all other race groups (53.1%-57.6%). Significantly more respondents from the Coloured (8.0%) and black African population groups (6.9%) indicated that they left home to collect a social grant compared to White and Indian/Asian population groups. About a third of respondents (33.6%) aged 18-29 years old indicated that they remained home throughout lockdown, leaving only to procure essential items (53.1%) collect social grants (7.0%) or visit friends (2.4%). Those aged 60 years and older, were more likely to leave home to collect social grants (10.7%) than those in other age groups (2.6%-7.0%). More respondents with no education or primary education were staying at home during lockdown without leaving (41.3%), going out to collect a social grant (13.2%) and visit a friend and socialise (3.4%), while tertiary level respondents (61.4%) and (53.6%) left home to purchase essentials. More unemployed respondents reported staying at home during lockdown (33.2%) than those who were employed, and respondents from rural (traditional tribal area) areas (33.9%) reported the highest prevalence of staying at home during the lockdown. A higher proportion of black Africans (1.4%), those aged 18-29 years (2.4%) and those with no/primary level education (3.4%) indicated that they visited friends compared to their counterparts.

Table **3** shows the confidence of respondents in their own, their family and their community's adherence to lockdown and self-isolation by demographic characteristics. Overall, the majority of respondents (92.3%) reported that they were confident in their own and their family's ability to adhere to lockdown and self-isolation regulations, while only 62.9% were confident in their neighbour's ability to do the same. Even fewer respondents (44.5%) were confident that their community was adhering to lockdown and self-isolation regulations. When considering the population group, white respondents (78.7%) were highly confident of their neighbours adhering to lockdown, but only 59.9% of black African population group respondents felt the same. Over 85% of respondents across all community types were highly confident of themselves and their families adhering to lockdown. However, while 72.8% of respondents from suburbs indicated that they were confident of their neighbours adhering to lockdown, only 47.6% of respondents from informal settlements felt the same.

Table 3. People's confidence of their family, neighbours and community adhering to lockdown and self-isolation order by demographics.

-	Sample	Confident that my Family and I are Adhering to the Order for Lockdown and Self-isolation		Confident that my Neighbours are Adhering to the Order for Lockdown and Self-isolation		Confident that my Community are Adhering to the Order for Lockdown and Self-isolation	
Characteristics	**n**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Total	**15,399**	**92.3**	**[91.7-92.9]**	**62.9**	**[61.7-64.0]**	**44.5**	**[43.3-45.7]**
Sex							
Female	9,544	93.0	[92.2-93.7]	63.2	[61.7-64.6]	44.2	[42.7-45.7]
Male	5,700	91.6	[90.6-92.5]	62.5	[60.7-64.3]	44.8	[43.0-46.7]
Population group							
Black African	7,431	91.3	[90.5-92.0]	59.9	[58.5-61.3]	41.8	[40.4-43.3]
White	5,590	97.6	[96.8-98.2]	78.7	[77.2-80.1]	58.0	[56.3-59.8]
Coloured	1,508	92.9	[91.4-94.2]	65.0	[62.1-67.8]	46.9	[43.9-50.0]
Indian/Asian	870	97.4	[96.1-98.3]	73.5	[69.9-76.7]	55.3	[51.2-59.3]
Age group							
18-29	4,557	89.4	[88.3-90.5]	55.1	[53.3-56.9]	37.4	[35.7-39.2]
30-39	4,338	91.3	[90.1-92.3]	58.3	[56.4-60.2]	39.0	[37.2-40.9]
40-49	3,080	93.5	[92.1-94.7]	63.3	[60.9-65.6]	43.5	[41.1-45.9]
50-59	1,967	94.4	[92.3-95.9]	69.7	[66.4-72.9]	50.2	[46.8-53.6]
60+	1,373	95.9	[93.7-97.3]	76.3	[72.3-80.0]	60.7	[56.4-64.9]
Education							
None/Primary	507	96.0	[93.5-97.5]	76.1	[71.2-80.5]	61.2	[55.6-66.6]
Secondary	1,889	92.0	[90.0-93.6]	64.8	[61.8-67.8]	47.1	[44.0-50.3]
Matric	5,083	90.5	[89.4-91.5]	59.3	[57.4-61.1]	39.6	[37.7-41.5]
Tertiary	7,920	93.3	[92.4-94.1]	63.0	[61.3-64.6]	44.9	[43.2-46.6]
Employment status							
Employed	9,603	92.6	[91.8-93.4]	62.1	[60.7-63.5]	43.6	[42.1-45.0]
Unemployed	5,796	92	[91.0-92.9]	63.8	[62.0-65.6]	45.6	[43.7-47.6]
Community type							
City	2,112	94.7	[92.7-96.2]	71.9	[69.0-74.7]	54.1	[50.7-57.4]

(Table 3) contd.....

-	Sample	Confident that my Family and I are Adhering to the Order for Lockdown and Self-isolation		Confident that my Neighbours are Adhering to the Order for Lockdown and Self-isolation		Confident that my Community are Adhering to the Order for Lockdown and Self-isolation	
Suburb	6,635	96.4	[95.7-97.0]	72.8	[71.0-74.6]	56.5	[54.5-58.5]
Township	3,336	89.1	[87.8-90.2]	51.5	[49.4-53.5]	31.9	[30.0-33.9]
Informal settlement	485	86.8	[83.1-89.7]	47.6	[42.4-52.9]	31.1	[26.5-36.2]
Rural (Traditional tribal area)	2,288	91.5	[89.9-92.9]	64.5	[61.8-67.1]	44.9	[42.1-47.8]
Farm	543	94.9	[89.9-97.5]	68.0	[59.6-75.4]	44.1	[37.2-51.2]
Province							
Western Cape	2,896	92.8	[91.3-94.0]	65.4	[63.0-67.8]	49.0	[46.5-51.6]
Eastern Cape	1,249	90.8	[88.4-92.8]	62.7	[58.5-66.7]	44.5	[40.1-48.9]
Northern Cape	195	87.3	[79.7-92.4]	57.8	[48.5-66.5]	37.0	[29.0-45.7]
Free State	551	91.9	[88.5-94.4]	56.1	[50.0-62.0]	32.1	[27.1-37.6]
KwaZulu-Natal	2,686	92.4	[91.0-93.6]	61.7	[59.2-64.0]	43.6	[41.1-46.2]
North-West	427	91.2	[87.5-93.9]	61.7	[55.7-67.4]	36.1	[30.6-42.0]
Gauteng	5,093	92.8	[91.8-93.6]	60.9	[59.1-62.7]	46.5	[44.7-48.4]
Mpumalanga	1,686	94.8	[93.4-96.0]	71.7	[68.6-74.6]	53.0	[49.6-56.5]
Limpopo	616	91.7	[88.1-94.2]	64.3	[59.2-69.1]	39.0	[33.8-44.4]

Sub-totals are not always equal to the overall total due to non-response or missing data. CI = Confidence Interval.

3.3. Factors Associated with Compliance with Lockdown

Shows the various factors associated with compliance as measured by the respondent's confidence in their community to adhere to lockdown. Respondents from the coloured population group (aOR = 0.85 95% CI [0.73-1.00], $p < 0.05$) were significantly less likely to be confident that their community was adhering to lockdown and self-isolation restrictions than black African respondents. Respondents aged 50 to 59 years (aOR = 1.37 (1.15-1.63), $p < 0.001$), and 60 years and older (aOR = 1.76 [1.40-2.23], $p < 0.001$) were more likely to be confident in their community's ability to adhere to lockdown and self-isolation restrictions than those aged 18 to 29 years. Those who were more literate, that is those with secondary (aOR = 0.74 [0.56-1.00], $p < 0.05$), matric (aOR = 0.54 [0.41-0.71], $p < 0.001$) or tertiary education (aOR = 0.49 [0.37-0.65], $p < 0.001$) were less likely to be confident that their community were adhering to lockdown and self-isolation restrictions than those with no education or primary education. Unemployed people (aOR = 1.13 [1.01-1.26], $p < 0.05$) were more likely to be confident that their community were adhering to lockdown and self-isolation order than those who were employed.

Table 4. Multiple logistic regression model showing factors associated with people's confidence on their community adhering to lockdown.

Variables	aOR	95% CI	p value
Sex	-	-	-
Female (ref)	-	-	-
Male	1.10	[1.00-1.22]	0.06
Population group	-	-	-
Black African (ref)	-	-	-
White	1.07	[0.91-1.27]	0.389
Coloured	0.85	[0.73-1.00]	<0.05
Indian/Asian	1.02	[0.83-1.24]	0.859
Age group	-	-	-
18-29 (ref)	-	-	-
30-39	1.03	[0.92-1.16]	0.589
40-49	1.13	[0.99-1.29]	0.077
50-59	1.37	[1.15-1.63]	<0.001
60+	1.76	[1.40-2.23]	<0.001
Education level	-	-	-
None/Primary (ref)	-	-	-
Secondary	0.74	[0.56-1.00]	<0.05
Matric	0.54	[0.41-0.71]	<0.001
Tertiary	0.49	[0.37-0.65]	<0.001
Employment status	-	-	-
Employed (ref)	-	-	-

(Table 4) contd.....

Variables	aOR	95% CI	p value
Unemployed	1.13	[1.01-1.26]	<0.05
Knowledge	-	-	-
Low (ref)	-	-	-
Moderate	1.02	[0.88-1.18]	0.790
High	1.11	[0.96-1.27]	0.166
Staying home is necessary	-	-	-
Disagree (ref)	-	-	-
Neutral	0.56	[0.40-0.78]	<0.001
Agree	0.74	[0.56-0.97]	<0.05
Risk perception	-	-	-
Low risk (ref)	-	-	-
Moderate risk	0.66	[0.58-0.74]	<0.001
High risk	0.81	[0.71-0.91]	<0.001
Community type	-	-	-
City (ref)	-	-	-
Suburb	1.12	[0.96-1.32]	0.147
Township	0.38	[0.32-0.45]	<0.001
Informal settlement	0.36	[0.27-0.48]	<0.001
Rural area	0.52	[0.43-0.64]	<0.001
Farm	0.57	[0.41-0.80]	<0.001
Constant	2.66	[1.71-4.15]	<0.001

aOR = Adjusted Odds Ratio.
CI = Confidence Interval.

Those who were neutral or unsure (aOR = 0.56 [0.40-0.78], $p < 0.001$) and those who agreed (aOR = 0.74 [0.56-0.97], $p < 0.05$) that staying at home was necessary to curb the spread of COVID-19 virus were less likely to be confident that their community were adhering to lockdown and self-isolation order than those who disagreed with the statement. Those who perceived their risk of contracting COVID-19 as moderate (aOR = 0.66 [0.58-0.74], $p < 0.001$) and high (aOR = 0.81 [0.71-0.91], $p < 0.001$) were less likely to be confident that their community were adhering to lockdown and self-isolation restrictions than those with low risk. Those residing in townships (aOR = 0.38 [0.32-0.45], $p < 0.001$), informal settlements (aOR = 0.36 [0.27-0.48], $p < 0.001$), rural areas (aOR = 0.52 [0.43-0.64], $p < 0.001$) and farms (aOR = 0.57 [0.41-0.80], $p < 0.001$) were less likely to be confident that their community were adhering to lockdown and self-isolation restrictions than those residing in cities.

4. DISCUSSION

As COVID-19 continues to spread across the globe, ascertaining regulations aimed at strengthening controlling the disease and flattening the epidemic curve is important [13]. This paper explored people's compliance with lockdown regulations, their confidence in their family, neighbours and the community's adherence to lockdown. The study found that the majority of respondents reported leaving home during lockdown to purchase essentials such as food and medicines, with a larger proportion of white respondents doing so. The results revealed that black African and Indian/Asian population groups, the unemployed, those aged 18-29 years and 60 years and older, those with no/primary level education respondents spent more time at home during the lockdown.

Leaving home to collect a social grant, which was permitted under the lockdown regulations, was more prevalent among the black African and coloured population groups, the 18-29 year and 60+ age groups, respondents from farms, informal settlements and rural areas. About 18 million people rely on social grants in SA, with 20% of households utilizing this grant as their main income source. Due to the socio-economic inequalities that exist in SA, more than 30 million of the population live within poverty lines, with the black African population group more susceptible to unemployment and poverty [14]. With the President announcing the lockdown on March 24th to begin as of March 26th at midnight, the majority of people were left vulnerable, as these grants are paid out at the end of the month or the beginning of the new month. Thus, South Africans reliant on social grants did not have the same opportunity as their counterparts to buy and stock extra essentials [15, 16]. Leaving home to collect social grants may have likely had implications for COVID-19 transmission because grant recipients often need to wait in long queues and wait times can last several hours, which would have made adherence to social distancing very difficult. Given that the elderly are at increased risk of severe COVID-19 outcomes, elderly grant recipients are not usually pushed to the front of the queues and these groups are therefore exposed to the risk of infection while waiting. Strategic policy and public health guidance during the pandemic should take cognisance of increased risk exposure resultant from collecting social grants, so as to protect these vulnerable groups. Governments need to explore innovative and effective ways of providing financial support to social grant recipients, such as delivering cheques. The lockdown would have also contributed to the loss of income, placing these households into a further crux of poverty. While members of households in homes of the rich, employed and financially stable would be able to work from

home, for the impoverished, unemployed and lowly-educated, the lockdown could cause loss of jobs, resulting in people seeking the unemployment insurance fund (UIF) as a temporary financial relief. Thus, wealth, and not income would be a deciding factor for survival during lockdown to sustain the households [17].

Although most people complied with lockdown, there was a small number of people who reported leaving home to socialise with neighbours and friends. A higher proportion of respondents from the black African population group, the 18-29-year age group, those from the farm and rural areas and informal settlements, non-educated or with primary education and the unemployed reported socialising with friends out of the home. Similar studies also reported young people, those in crowded areas and with lower levels of education, went out to socialise during pandemics. In many impoverished households, with an average of five family members residing together, only 45% have an employed family member [17]. With overcrowded environments in informal settlements, people are more likely to step out of the house for personal space. It is possible that those who did not have the privilege of working from home during the pandemic, those who were no longer attending educational centres, unemployed and without entertainment in the home, may end up socialising with friends to pass the time.

Rural areas, informal settlements and townships are high-density areas where social interactions continued during the lockdown. People in these areas and circumstances do not have the luxury of self-quarantine or self-isolation. They face daily struggles for clean drinking water, collecting leaves and wood for fires, and accessing shared toilets, thus leaving them no choice but to venture outdoors, and inadvertently interact with people. While streets may be deserted during the lockdown, taverns became the place to drink and socialize, where people drink beer out of the same bottles [18]. Unreliable electricity in these areas led to important government announcements about the virus being missed. Some with access to the internet and social media rely on misinformation; the fallacy that drinking concoctions of lemon, cayenne pepper and garlic would render them immune from the virus [19]. COVID-19 has reached to an extent to which spatial inequalities define the reality of SA post-apartheid, where it is almost impossible to social distance or self-isolate during lockdown in areas where population density is high, and a single household may have many people sharing a confined space.

The majority of respondents of all population groups, age groups, education and employment status, were extremely confident of themselves and their families adhering to the lockdown and self-isolation regulations. They were moderately confident of their neighbours adhering to lockdown, while a low percentage of them indicated having the confidence of their community's adherence to lockdown. The final model revealed that the coloured population group, those aged 18-29 years, those who were more literate (those with secondary, matric and tertiary education status), those residing in informal settlements, townships, rural areas and farms, and those who perceived their risk of contracting COVID-19 as moderate and high reported not being confident of their community adhering to lockdown. These findings highlight the afore-mentioned racial and spatial inequalities that people face living in rural areas, townships, informal settlements and farms as compared to their counterparts living in the city and suburbs. Lockdown and self-isolation adherence has been previously associated with an increased perceived risk of contracting a virus [20]. The risk perception of people during a pandemic is a contributing factor to increased public participation in adopting preventive measures. During a pandemic, it is vital that correct information sources are accessed to increase public awareness of the virus and educate about how the virus is transmitted, thus resulting in improved adoption of preventive measures and adherence to regulations [21]. A previous study indicated that a longer quarantine or lockdown resulted in more stressors and this is exacerbated when governments send mixed messages about the restrictions and people do not have adequate access to the internet. This results in misinformation, creating unnecessary fallacy among populations, and therefore people not understanding how to correctly maintain social distancing [23, 24]. Public compliance is high when governments partner with respected and trusted figures such as traditional and religious leaders, famous singers, artists and sports celebrities to spread messages and information regarding the pandemic.

5. LIMITATIONS

This study is not without some limitations. Online surveys contribute to the limitations as some sub-populations are unlikely to have access to the internet and therefore could not respond to the questionnaire. The survey sample for the online survey is drawn through visiting websites. People with no access to smartphones, no education, people living in informal settlements and farms and those living in smaller provinces did not have an equal chance of participating in the online survey. The telephonic survey was introduced in an effort to reduce this bias. The data were therefore benchmarked to the national adult population estimates to increase the generalisability of the findings. Disproportionate participation rates are likely to reflect the issue of access to internet and technology, as well as connectivity. The self-reporting nature of the data collected maybe be a possible limitation as it gives room for biased responses with potential exaggeration, questions being answered untruthfully, or giving responses that are desirable due to the nature of the COVID-19 pandemic. However, a strength of this study is the use of rapid online surveys, that provide results in real-time, as the COVID-19 pandemic unravels [22].

CONCLUSION

The paper provides evidence of the level of compliance with lockdown regulations in a low- and middle-income country (LMIC) early on in its lockdown stages. It is evident that over a short period, a lockdown is considered appropriate to curb the spread of the virus. The majority of people stayed at home, only going out to purchase food, medicine and other essentials or to collect a social grant. There was also a majority that was highly confident of their adherence to lockdown and self-isolation regulations, with moderate confidence of their neighbours adhering to lockdown. It identifies groups of people who were less compliant with regulations, such as the poorer

populations living in crowded areas. While these indicate a level of success of the full lockdown, we must be cognizant of the fact that this was in the early phase of the viral spread in the country, where confirmed cases and deaths were low. Lockdown implementation has been necessary in preparation of the country for delaying the spike in cases and infections.

Policy and public health education need to adequately address low levels of compliance among these subgroups by, for example, increasing knowledge, creating enabling environments, and creating more suitable, efficient and innovative ways for social grant provision. The paper provides lessons learned and recommendations that are relevant for South Africa and other LMIC countries as they continue to implement restrictive lockdowns or ease economic activity.

LIST OF ABBREVIATIONS

aOR	=	Adjusted Odds Ratio
CI	=	Confidence Interval
COVID-19	=	Coronavirus Disease 2019
IP	=	Internet Protocol
PHEIC	=	Public Health Emergency of International Concern
SANDF	=	South African National Defence Force
SA	=	Statistics South Africa
UIF	=	Unemployment Insurance Fund
WHO	=	World Health Organization

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The ethical approval for the study was received from the Ethics Committee Human Sciences Research Council, South Africa (Protocol number: REC 5/03/20).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Participants from the telephonic administered platform provided verbal consent that was recorded by the data capturers.

AVAILABILITY OF DATA AND MATERIALS

All data generated or analysed during this study are available from the corresponding author [N.D] on request.

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None.

CONFLICTS OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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