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# Managing the COVID-19 pandemic in poor urban neighborhoods: The case of Accra and Johannesburg

Kathrin Durizzo<sup>a,\*</sup>, Edward Asiedu<sup>b,c</sup>, Antoinette Van der Merwe<sup>a</sup>, Attie Van Niekerk<sup>d,e</sup>, Isabel Günther<sup>a</sup><sup>a</sup> Development Economics Group & Center for Development and Cooperation (NADEL), ETH Zurich, Clausiusstrasse 37, 8092 Zurich, Switzerland<sup>b</sup> University of Ghana Business School (UGBS), P.O. Box LG 78, Legon, Accra, Ghana<sup>c</sup> Chair of Development Economics, University of Passau, Innstrasse 41, 94032 Passau, Germany<sup>d</sup> Faculty of Theology, University of Pretoria, Lynnwood Road, Pretoria 0002, South Africa<sup>e</sup> Nova Institute, 13 Beuke Place, Pretoria 0041, South Africa

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## ABSTRACT

Without a vaccine, practicing social distancing and protective hygiene are the most effective measures to curb the spread of COVID-19. In order to understand how the urban poor mitigate their risk of infection, we conducted a survey with more than 1,400 poor households in two of the African cities with the most COVID-19 infections, Accra and Greater Johannesburg, early in the pandemic, during lockdowns of public life. We find that many of the urban poor already engage in the appropriate hygienic behavior and follow social distancing rules. However, despite citywide lockdowns, about 25–40% of people still report attending large gatherings, 10–20% report receiving guests at home, and 30–35% report leaving the house more than once per week. Lack of cooperation with governmental regulations seems to be more related to a lack of infrastructure or poverty rather than unwillingness to engage in behavioral change. Interestingly, even with the stricter lockdown in South Africa, people are at least equally likely to deviate from social distancing rules. Our results indicate that more South African respondents perceive their government's actions as too extreme and underestimate COVID-19 cases in their country. About half of the sample in both countries report knowing (mainly through TV) about current COVID-19 case numbers. Most participants know that coughing is a symptom, but only half mention fever and difficulty breathing, and very few people mention tiredness. Ghanaians seem to be somewhat better informed. While lack of information is an issue, misinformation appears to be limited. We conclude that a costly shutdown of public life is only effective—and might even be prevented—with a well-informed population, who perceives their government's actions as appropriate and who has access to the infrastructure required to follow WHO safety regulations.

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## 1. Introduction

Epidemics on the African continent are frequent: between 2016 and 2018, 87% of African countries experienced at least one epidemic (Talisuna et al., 2020). By February 2020, the novel Coronavirus, SARS-CoV-2, which leads to the disease COVID-19, had reached all African countries. Despite spreading at a slower speed than in other regions of the world – probably due to a mix of the early curfews instated by many African governments, a younger population, and lower connectivity in terms of air travel –

COVID-19 and the measures to curb its spread will have a significant impact across the African continent, especially on the millions of poor people living in cities.

COVID-19 has already challenged many countries with well-financed healthcare systems, causing concern about what will happen in African countries. For example, the US and Switzerland have about 2.6 and 4.2 physicians per 1,000 people, respectively, compared to most African countries that have only 0.2 doctors and 1.2 hospital beds per 1,000 people. Countries like Chad have as little as 0.05 physicians per 1,000 people (World Bank, 2020). The deadly Ebola pandemic of 2014–2016 revealed how ill-prepared countries in West Africa were to handle such a crisis (Hoffman & Silverberg, 2018; Kapata et al., 2020).

Recognizing the limited capacity of medical services to handle a pandemic, most African governments imposed various lockdown measures to regulate public, and even elements of private, life to

\* Corresponding author.

E-mail addresses: [kathrin.durizzo@nadel.ethz.ch](mailto:kathrin.durizzo@nadel.ethz.ch) (K. Durizzo), [edasiedu@ug.edu.gh](mailto:edasiedu@ug.edu.gh) (E. Asiedu), [antoinette.vandermerwe@nadel.ethz.ch](mailto:antoinette.vandermerwe@nadel.ethz.ch) (A. Van der Merwe), [attievanniekerk@nova.org.za](mailto:attievanniekerk@nova.org.za) (A. Van Niekerk), [isabel.guenther@nadel.ethz.ch](mailto:isabel.guenther@nadel.ethz.ch) (I. Günther).

enforce social distancing early in the pandemic. The cost of such lockdowns, however, is highest for poor individuals, who are more likely to work in the informal economy and/or depend on a daily wage: for them, extreme physical-distancing regulations lead to an immediate loss of income. Recent studies on the impact of a shutdown of economic activities on low-income families consistently find that income and food consumption are reduced significantly (Aushian & Abuya, 2020; HSRC, 2020; Kesar et al., 2020; Le Nestour et al., 2020; Malik et al., 2020; Rahman & Matin, 2020). Due to the extraordinarily high economic burden on the poor and following social unrest (Akinwotu & Asiedu, 2020; Egger et al., 2020; Ward, 2020) and police and military brutality (Lamb, 2020; Ngqakamba, 2020; Wemakor, 2020), African constituents have been pressuring their governments, who are relaxing restrictions (Giles & Mwai, 2020; Tih, 2020) despite rising daily case numbers.

Costly lockdowns of public life are only effective to curb the spread of a pandemic if a large percentage of the population fully cooperates with imposed regulations. Cooperation becomes even more important once lockdowns and other regulations are lifted, making a reduction of personal interactions and an increase in personal hygiene voluntary. Moreover, with widespread cooperation in place, drastic national restrictions, such as lengthy curfews, could even be avoided in the future. Until a vaccination is available for most, living with COVID-19 will require drastic behavioral changes and cooperation from a large share of the population.

In this paper, we analyze how the urban poor in Ghana and South Africa – two countries with currently some of the highest recorded COVID-19 numbers in sub-Saharan Africa – experience and manage the COVID-19 crisis during citywide lockdowns. In particular, we study the behavior of the urban poor to mitigate their risk of infection early on in the pandemic and during national lockdowns. Moreover, we investigate people's knowledge and anxieties about COVID-19 (see also: Lin et al., 2020; Oosterhoff & Palmer, 2020; Roy et al., 2020)<sup>1</sup>, their trust in the government to take appropriate action to curb COVID-19 (see also: Briscese et al., 2020; Egger et al., 2020; Painter & Qiu, 2020), and the costs of and/or barriers to social distancing and hygienic behavior they face (see also: Baye, 2020; Wasdani & Prasad, 2020). These three factors should drive people's behavior during lockdowns and throughout the duration of the pandemic, in general.

We conducted structured phone surveys with people living in poor urban areas in the greater Johannesburg and Accra areas. Our study is unique in a number of important ways. Many other studies on the impact of COVID-19 and measures to contain it rely on randomly generated phone numbers (Le Nestour et al., 2020) or sample using self-selection into online surveys (Fetzer et al., 2020; Roy et al., 2020; Wise et al., 2020; Oosterhoff & Palmer, 2020). The advantage of our sample is that we already knew the socio-demographic characteristics before the survey and, therefore, could specifically choose poor urban settlements where social distancing is hardest and the risk of COVID-19 spreading is highest. Indeed, by the end of May 2020, the study areas we selected were some of the most affected regions in their respective countries (Cowan, 2020; Salaudeen, 2020). In addition, the sample was randomly drawn from a representative sample within these areas.<sup>2</sup> Lastly, we personally interviewed the households on the phone and were, therefore, able to ask a longer set of questions, which is

not feasible with online surveys and computer-assisted telephone interviewing, allowing us to cover various dimensions of people's lives.

Our major findings are that despite many similarities between the urban poor populations around Accra and Johannesburg, the impact of curfews on these societies differs significantly: most Ghanaians are affected by the loss of income and increasing food prices, while many South Africans fear getting sick and are very anxious about the future. We also find that people in Accra and Johannesburg did not follow all governmental regulations during the citywide lockdowns. Our results indicate that the challenge is more the ability (because of lack of space and infrastructure) than the willingness of the population to cooperate with behavioral change. Interestingly, the stricter lockdown measures in South Africa in comparison to Ghana do not lead to fewer social interactions or increased hygienic measures. Our results suggest that the reason might be that the urban poor in Ghana are slightly better informed about COVID-19 and consider governmental policies to be more appropriate. In Ghana, however, few people could keep a one-meter distance to others in their daily life because the majority rely on public transportation and shared toilets.

The results of this study should support national and international organizations in fostering safer health behavior in poor and densely populated neighborhoods.

## 2. Context for Ghana and South Africa

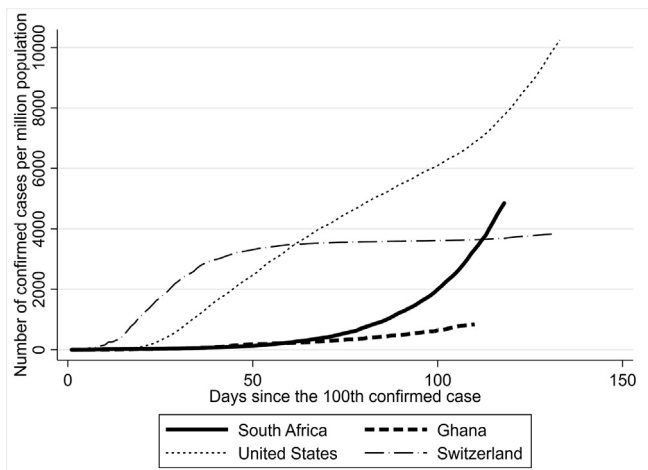
On February 14, 2020, the first confirmed case of COVID-19 in Africa was diagnosed in Egypt. Two weeks later, the first case in a sub-Saharan African country was identified in Nigeria. Since then, the number has increased to 614,412 confirmed cases in Africa (July 13, 2020; Hopkins, 2020). South Africa and Ghana, both middle-income countries, are the sub-Saharan African countries with the highest (287,796) and third-highest (24,988) number of confirmed cases, respectively (July 13, 2020; Hopkins, 2020). In both countries, most of the cases occur in major cities, such as Cape Town and Johannesburg or Accra and Kumasi. Although the number of reported cases is highly influenced by testing rates, South Africa and Ghana have some of the highest testing rates in sub-Saharan Africa, with 36,312 and 10,563 tests per million people, respectively. These testing rates are still relatively low compared to rates in Europe; for example, Switzerland has tested 79,286 per million people (July 13, 2020; Worldometer, 2020).

Fig. 1 shows the development of confirmed COVID-19 cases for South Africa and Ghana with the trajectories from the United States and Switzerland for comparison. In order to compare across countries, the x-axis indicates the days after the 100th confirmed case, which was on March 26 in Ghana, March 19 in South Africa, March 5 in Switzerland, and March 3 in the United States. Case numbers are still rising in Ghana and South Africa, despite early strict curfews in both countries, which lasted three weeks in Ghana and more than ten weeks in South Africa.

Similar to many other countries in sub-Saharan Africa, but in contrast to Europe and the US, both Ghana and South Africa implemented several governmental regulations to reduce contact between people even before the 100th confirmed case, including closing schools and universities, closing certain borders, and banning large gatherings. Thereafter, the respective governments chose different approaches. South Africa implemented a lengthy nation-wide lockdown that has been in place since March 27, 2020. Although some regulations were lifted after ten weeks, the lockdown is still ongoing at the time of writing. From March 30, 2020, Ghana opted for a lockdown around the most affected cities only (Accra and Kumasi), which was lifted three weeks later on

<sup>1</sup> For example, Lin et al. (2020) found in a study of 21 countries, that higher levels of health literacy is associated with a lower spread of COVID-19: higher searches on Google of the terms "hand washing" and "face mask" were correlated with a slower spread of virus.

<sup>2</sup> The only source of bias occurs due to respondent not picking up the phone and respondents not wanting to participate. However, both sources were very low in our sample.

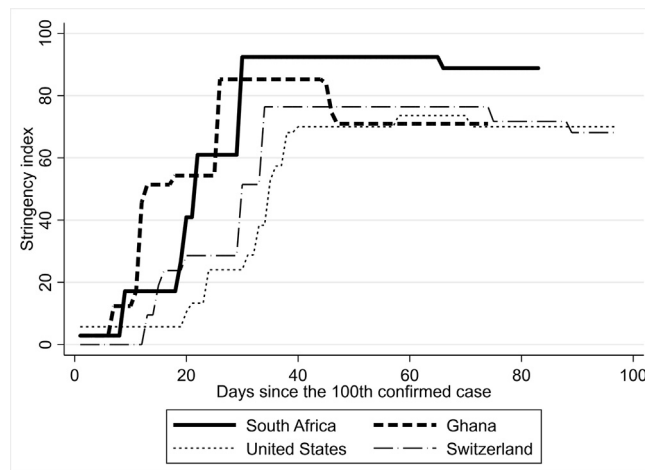


**Fig. 1.** Number of total confirmed COVID-19 cases in South Africa and Ghana  
 Note: First day since the 100th confirmed case is March 26 for Ghana, March 19 for South Africa, March 5 for Switzerland, and March 3 for the United States. Source: WHO (2020a), GHS (2020), Johns Hopkins (2020), Mervosh et al. (2020) – last update July 13, 2020.

April 20, 2020, due to fears about the worsening economic situation of the population (Akinwotu & Asiedu, 2020).

During our survey end of April and beginning of May 2020, South Africa had one of the strictest lockdowns in the world (see Fig. 2). The most stringent level, “Level Five,” was implemented from March 27 to April 30, 2020. During Level Five, only essential services were allowed to stay open: food production and retail, electricity generation, and medical and emergency services. In addition, all outdoor activities and the sale of alcohol and cigarettes were prohibited. On May 1, 2020, South Africa transitioned to “Level Four,” in which additional services were allowed to open up, such as work in forestry, certain manufacturing sectors such as cement and automotive, certain civil engineering projects, sale of cooked food, sale of educational books, all social work, and counseling. Social gatherings were still prohibited during “Level Four”. Some outdoor exercise was permitted, but only between 6:00 am and 9:00 am. Since the number of allowable activities increased during Level Four, masks were made mandatory. “Level Three” was implemented beginning June 1, 2020, which allowed some domestic travel between provinces, funerals and religious gatherings of fewer than 50 people, the opening of restaurants to sell meals not consumed on the premises, and, initially, the sale of alcohol, though this was later prohibited again (SAcoronavirus, 2020).

In Ghana, between March 30 and April 20, 2020, only essential services were allowed to open in Accra and Kumasi, such as food retailers, utility (electricity and water) distributors and retailers, pharmacies, and medical services. For many informal market places, a rotational system for vendors was put in place to prevent overcrowding. After agitations over worsening economic conditions in the country, particularly for the poor, whose main economic activities are in the informal marketplaces, the government ended the lockdown. However, many public social distancing measures remained in place: schools, churches, and mosques stayed closed, bars and restaurants were encouraged to do deliveries rather than allow customers to sit at their premises, and funerals, weddings and other social gathering were limited to 25 persons. Moreover, on April 25, wearing face masks in public was made mandatory in Accra in order to prevent the spread of the virus after lifting the lockdown (GHS, 2020). On May 10, the President of Ghana extended the ban on social gatherings until May 31 to contain the increasing number of infections. Under the directive,



**Fig. 2.** Stringency index from South Africa and Ghana  
 Note: The Government Response Stringency Index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest response). This index should not be interpreted as “scoring” the appropriateness or effectiveness of a county’s response; it simply records the number and the strictness of government policies. The 100th confirmed case was on March 26 in Ghana, March 19 in South Africa, March 5 in Switzerland, and March 3 in the United States. Source: Hale et al. (2020) – last updated July 13, 2020.

religious activities, festivals, schools, weddings, funerals, parties, and the country’s borders remained closed. However, on the next day, the government of Ghana gave hotels, bars and restaurants permission to reopen under enhanced social distancing procedures. On June 5, restrictions on religious activities were eased, with churches and mosques allowed a maximum attendance of 100 persons.

### 3. Methodology and data

#### 3.1. Sampling procedure and survey tool

We conducted a fully structured phone survey with 1,443 randomly selected households living in 18 urban settlements in the Greater Accra region in Ghana<sup>3</sup> and in two urban low-income settlements east of the city of Johannesburg. A map showing the location of the settlements can be found in Figs. A1 and A2 in the Appendix. We obtained ethical clearance for both the South African and Ghanaian studies (available from the authors upon request). Enumerators in South Africa and Ghana were trained by one of the co-authors via phone.

The sample in South Africa was drawn from a database that had been aggregated as part of a 2013 study that was conducted with 3,000 randomly selected households out of about 80,000 households in two poor urban settlements, Etwatwa and Daveyton.<sup>4</sup> The telephone numbers of more than 2,000 households were randomly drawn from these 3,000 households, of which 1,398 were called by four enumerators during Levels Five and Four of the lockdown, from April 16 to May 9, 2020 (days 20–43 after the 100th confirmed case, as shown in Figs. 1 and 2). Of the calls that were placed, 31% were directly answered, 15% of the numbers were invalid, 10% of the calls rang without answer, and 44% were answered by voicemail. Some of the unsuccessful call recipients were contacted again, of

<sup>3</sup> Abeka, Ablekuma, Accra New Town, Alajo, Ashaiman, Chorkor, Gbgebungise, Jamestown, Kokomlemle, Kotobabi, La, Maamobi, Madina, Mamprobi, Nima, Pig Farm, Sabon Zongo, Ussher Town

<sup>4</sup> If there was nobody at a specific house, fieldworkers visited their neighbours on the right and then on their left until a respondent was found.

which an additional 80 calls were answered. Of the calls that were answered, 20% did not want to take part in the phone survey. In total, enumerators completed 409 surveys.<sup>5</sup>

In Ghana, the Ghana Statistical Service (GSS) provided us with a representative sample of the 18 low-income settlements in the Greater Accra region, which was drawn from the most recent Ghana Living Standard Survey (GLSS7) carried out in 2017. From a total of 15,679 phone numbers, 2,260 households, stratified at and proportional to the settlement-level, were randomly drawn. The phone surveys were administered by 16 enumerators who called these numbers during Accra's lockdown from April 23–29, 2020 (day 31–37 after the 100th confirmed case, as shown in Figs. 1 and 2). If the respondent did not pick up the phone, enumerators called back once more at a different time of the day (either morning or afternoon). Of the 2,260 numbers, 3% were not valid, 20% were unanswered, 22% were a wrong number, 5% belonged to a respondent who did not want to participate in the survey, and 3% belonged to a respondent who had moved to another neighborhood not affected by the lockdown. One respondent was younger than 18 and two respondents did not want to complete the questionnaire, so these interviews were stopped. In total, 1,034 households answered the survey.

The survey took on average 19 min in Ghana and 17 min in South Africa and contained 84 questions in Ghana and 68 questions in South Africa. Of all the questions, 66 are identical for Ghana and South Africa, which allows for comparison across most questions. The questionnaire is available on request.

### 3.2. Sample description

In Ghana, proportionally fewer females are included in the sample (37%) because the GLSS7 includes the phone numbers of the household head, which is a man in most of the cases. In contrast, the sample from South Africa includes 75% female respondents (see Table 1), probably because women were more likely to be at home when the households were visited in person for the first time in 2013. Despite the difference in males and females between the two countries, results are not driven by gender, except when otherwise stated (additional sub-group analyses are available from the authors upon request).

Both urban samples are very poor (see Table 1). In South Africa, the larger municipality, Ekurhuleni, which encompasses both settlements, is one of three municipalities with the highest estimated number of people living in poverty in the country. Moreover, both settlements have an even higher percentage of people receiving no income and a higher percentage of people living in informal dwellings than the average in Ekurhuleni (StatsSA, 2020). The 18 settlements interviewed in Ghana are the poorest areas in Greater Accra according to the Ghana Statistical Service.

About 9% in Ghana and 20% in South Africa have not completed primary education (Table 1). In the South African sample, unemployment (57%) is much higher than in Ghana (4%), however, employment in South Africa is more formalized; two-thirds of the employed respondents have a contract, compared to less than half of the employed in Ghana (Table 1). Most Ghanaians in our sample are either self-employed or work without a contract.

In South Africa, before the lockdown, the main sources of household income were child grants (49%) or pensions (21%). Income from own business activities or wage income only played a minor role. In Ghana, due to the high rate of self-employment, income from own businesses is the main income source for most

**Table 1**  
Household characteristics of the sample from South Africa and Ghana.

	South Africa	Ghana
Female	75%	37%
Age (average in years)	40–49 years	40–49 years
Household members	5.2	5.3
Number of rooms	4.5	2.4
Average number of rooms per person	1.0	0.6
Shared water source with other households	3%	13%
Shared toilet with other households	8%	66%
<i>Education</i>		
No education level completed	20%	9%
Primary education completed only	44%	9%
Secondary education completed only	29%	74%
Tertiary education completed	7%	8%
<i>Working Status</i>		
Unemployed	57%	4%
Self-employed	4%	44%
Employed without contract	6%	24%
Employed with contract	12%	22%
Other working status	20%	6%
Do not want to say	1%	0%
<i>Main source of income for the household</i>		
Salary from work	21%	23%
Own business	5%	58%
National grants	64%	5%
Support from family members	11%	20%
Other source of income	7%	9%

Note: Number of household members were specified up to 11 people – more than 11 are counted as 12 for the average calculation. Number of rooms were specified up to 10 rooms – more than 10 are counted as 11 for the average calculation. Working status and main source of income refer to the period before the lockdown. Other working status includes Housewife/homemaker, retired person/pensioner, school pupil/full-time student, unable to work due to disability, and unemployed not looking for a job. For the household's main sources of income, the respondents could mention several sources. National grants include child support grants, old-age pensions, and disability grants.

households (58%), followed by salary from work (23%), and financial support from a family member (20%). Less than 5% of the respondents receive a grant from the government.

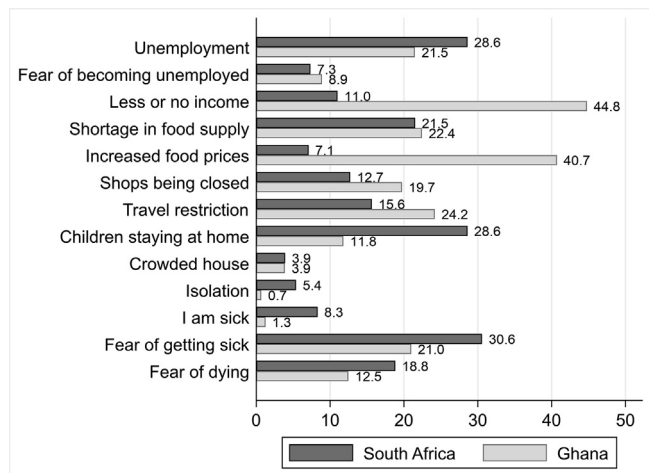
## 4. Results

### 4.1. Impact of COVID-19 pandemic on people's life

Various studies have pointed out the severe, direct economic impacts of lockdowns of public life on the global poor (Aushian & Abuya, 2020; BRAC, 2020; HSRC, 2020; Kesar et al., 2020; Le Nestour et al., 2020; Malik et al., 2020; Rahman & Matin, 2020; Sumner et al., 2020). However, few studies in low-income settings analyze the impact of lockdowns on other dimensions of well-being, such as schooling of children, health concerns, and emotional stress, which can, in turn, be triggered by direct income loss, anxieties about future income, reduced social interaction, and isolation at home. Initial studies from high-income countries show that mental health is becoming a serious problem (Fetzer et al., 2020). Anxieties related to potential infection might be especially problematic in South Africa, where many people suffer from HIV/AIDS and could fear increased rates of domestic violence resulting from lockdowns (Joska et al., 2020). In addition, the trauma caused by recent Ebola outbreaks in West Africa could increase anxiety and fear about the COVID-19 pandemic in Ghana (Leach, 2020).

To better understand the impact of the pandemic on the urban poor, we first asked an open question about how the pandemic is currently affecting the respondent the most (see Fig. 3). Despite many similarities – both samples studied are from poor urban neighborhoods under strict curfews in middle-income African

<sup>5</sup> In addition, we called 509 rural households which are not included in this analysis.



**Fig. 3.** Factors affecting people the most in sample from South Africa and Ghana. Note: Question “Name three ways how the Coronavirus crisis is affecting you personally at the moment?”

countries – the reported experiences are quite different. In South Africa, women mention fear of getting sick (35%) and children being home (31%) most often and men mention unemployment (39%) and children being home (21%) most often.<sup>6</sup> In Ghana, meanwhile, no income (45%) and increased prices (41%) stand out for both men and women. The leading single source of income for the urban poor in South Africa are grants from the government (see Table 1), which have been largely unaffected by the virus. Almost all grant-receiving South African respondents say they can still collect their previous grant as usual during national lockdowns. In this regard, South Africa already has a system in place to disperse income to those in need – including during a national lockdown. In contrast, 67% of self-employed workers in South Africa and 86% of self-employed workers in Ghana had to close their businesses during citywide lockdowns and did not obtain any income. Isolation is mentioned by less than 6% of people in South Africa and only 1% in Ghana, which is identified as a major health risk in various studies in high-income countries, such as the United Kingdom (Mahase, 2020; Armitage & Nellums, 2020). Of all Ghanaians, 39% report that a specific item was not affordable because of an increase in price. In particular, respondents say that they cannot afford basic foods such as beans, cassava, or jam (33%), vegetables (23%), and fruits (9%). Increased prices are less of a problem in South Africa than lack of food item (see Fig. 3): of all respondents in our South African sample, 22% report that certain items, such as bread and maize porridge, were not available for purchase the last time they went shopping.

In addition, we also ask respondents directly to what extent they are anxious about the health of their families, reduced mobility, lower income, and food, and to what extent they generally feel depressed. In general, anxiety seems to be high in both countries, but higher in our South African sample. In both countries, people are more anxious about their future income than about their health and/or reduced mobility. Of the sample in South Africa, 60% worry about not getting enough food in the future, while 32% of the sample in Ghana shares this worry. Serious worries about lower incomes rank even higher, with 67% in South Africa and 48% in Ghana (Table 2). In South Africa, 51% of the sample say they worry about the health of their families, while in Ghana, 37% of the sam-

**Table 2**  
Emotional well-being in sample from South Africa and Ghana.

	South Africa	Ghana
I am worried about lower income of my household	67%	48%
I am worried about not getting enough food in the future	60%	32%
I am worried about the health of my family	51%	37%
I am worried about my health	45%	34%
I feel stressed when leaving the house	34%	24%
I am afraid of someone I am sharing my house with	8%	26%
I feel down, depressed, hopeless (somewhat and strongly)	51%	37%

Note: Question, “To which extent do the following statements apply to you right now?” Respondents could choose from the scale “Does not apply at all”, “Somewhat does not apply”, “Neither apply or does not apply”, “Somewhat applies”, “Strongly applies”, “Do not know/Do not want to say”.

ple say they have this worry, which is similar to India where 38% of people report serious stress due to fear of infection (Roy et al., 2020). About 70% of South Africans and 35% of Ghanaians say they pray on a daily basis to stay healthy. Only 34% of South Africans and 24% of Ghanaians say they are stressed when they leave their homes. In South Africa, 51%, and in Ghana, 37% of the urban poor feel somewhat or strongly down and depressed. In comparison, a study in India reveals that 65% of the urban poor feel depressed (Afridi et al., 2020). Hence, the pandemic not only affects the urban poor’s economic situation, but also has a severe impact on their mental well-being, which deserves more attention in future research.

Finally, children being home are mentioned in both Ghana (12%) and South Africa (29%) as one of the major impacts of COVID-19. This finding is expected, since 64% of South Africans and 52% of Ghanaians mention that they have school-age children at home, which is high compared to about 30% of households in the US and Switzerland (Bundesamt für Statistik, 2017; Kidsdata, 2020). What is even more worrying is that in South Africa 37% of the school children (age 7–15) had not been reading or studying the day before, compared to 17% in Ghana. The children who studied or read the previous day did so for only 60 min on average in South Africa and for 90 min on average in Ghana. In addition, 71% of South African children and 46% of Ghanaian children in our sample used to receive food at school, which they no longer receive since the schools closed. In South Africa, schools are slowly starting to reopen; critical grades, such as the final years of primary and secondary school, resumed classes on June 1, 2020. Many schools are open at half capacity only, with pupils divided into two groups, each group only attending school on alternating days or weeks. In Ghana, only final year students from the Senior High School (SHS) and Junior High School (JHS) resumed school in preparation for their exit examinations on June 22 and June 29, 2020, respectively. Despite the safety measures instituted by the Ministry of Education (MOE), some students have contracted the virus at school and some parents are threatening to withdraw their children from school.

Even if respondents in South Africa and Ghana have, thus far, experienced the pandemic differently, our results indicate that stringent national lockdowns have a substantial impact on the economic lives and mental well-being of almost all study participants and threaten the future prospects of children. The question remains how effective these lockdowns are at motivating people to make the necessary behavioral changes needed to contain the spread of the virus – and how these behavioral changes can be maintained after the lockdowns are lifted. We address these questions in the following sections.

<sup>6</sup> Figure 3 shows average values

#### 4.2. Behaviour of the population during the lockdown

According to current medical advice and as communicated by the WHO and most national governments, the most effective measures to reduce the transmission of COVID-19 are to follow preventive hygienic measures and to keep a safe distance from other people. Hygienic measures include washing hands regularly with soap or alcoholic disinfectants, wearing a face mask, avoiding shaking hands, and not touching surfaces in public. Keeping a safe distance, the reason why drastic lockdowns were put in place, includes avoiding crowded places, such as large gatherings and public transport, keeping one-meter distance from others where possible, and staying home, if possible. To understand how many of these measures people implemented when South Africa's national lockdown and Accra's citywide lockdown were in place, we ask each participant whether he or she had practiced the following key preventative actions on a daily basis over the last seven days:<sup>7</sup>

##### Hygienic measures:

- (1) always washes hands with soap or alcoholic disinfectants;
- (2) always wears a face mask when leaving the house;
- (3) avoids shaking hands;
- (4) avoids touching surfaces in public;

##### Social distancing measures:

- (5) does not receive guests;
- (6) does not visit others;
- (7) does not leave the house more than once per week;
- (8) never attends large gatherings, such as churches and market places;
- (9) avoids public transport (only asked in Ghana);
- (10) tries to keep a one-meter distance between her/him and other people (only asked in Ghana);

For both countries, the most common preventative measure is always washing hands with soap (or alcoholic disinfectants), followed by avoiding private meetings at home and shaking hands – measures that households can implement at no or very low financial cost. Nevertheless, 17% of the urban poor in South Africa and 12% in Ghana report that they do not always wash their hands with soap (Fig. 4). In South Africa and Ghana, 3% and 1% report that they do not even have soap at home. We also ask, in an open question, if anything was not available in the shops that they wanted to buy during the previous week: in South Africa, 3.5% of respondents mention that hand sanitizer or soap were not available, compared to only four respondents (0.4%) in Ghana. Moreover, 18% of the respondents in South Africa and 44% in Ghana report that their usual water source had been disrupted at least once during the previous week. Affordability was not an issue in Ghana at the time of the survey because the Ghanaian government made piped water to residences free for three months (April-June 2020).

About 50% of the sample in Accra and Johannesburg already wore a mask in public on a daily basis even before it was made mandatory by the governments. Wearing face masks was made mandatory during the time we were conducting the survey in South Africa (all South Africans were expected to wear masks from May 1, 2020), which had a significant impact on reported usage: average reported usage increased from 56% to 72% in South Africa (Fig. 4 shows the average reported usage for the entire study period). Wearing a face mask was only made mandatory in Ghana

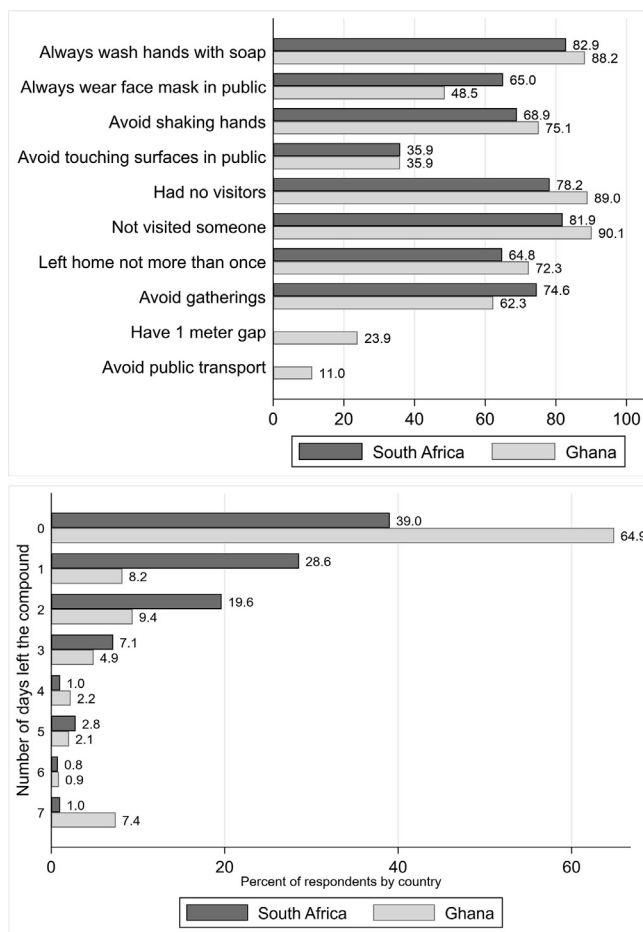


Fig. 4. Individuals' behavior in the last seven days in the sample from South Africa and Ghana

Note: The top figure shows results from the question "Which of the following statements reflect your daily behavior over the past 7 days?" For South Africa, the two categories "one meter gap" and "avoid public transport" are not available. The bottom figure shows responses to the question "How many days in the last week were you outside your compound?".

after the study period, on June 14, 2020 (Presidency, 2020). Although only half of the Ghanaian respondents mention that they always wore a face mask in public within the last seven days, 81% state that they already own a face mask. They report that the average cost for a mask is around 3.7 GHS (0.60 USD). The main reasons why the remaining 19% of people in Ghana do not own a face mask are inconvenience (33%), inability to get one (24%), do not know (14%), or too expensive (13%). Only a few respondents mention no need (2%) or answer "do not want to say" (2%).

South African respondents are more likely than Ghanaians to have visited someone outside their house during the last week (18% vs. 10%), and more likely to have received guests at their own home (22% vs. 11%) (Fig. 4). Note that visiting others and receiving guests were not allowed under the curfews put in place in both Ghana and South Africa. Moreover, even if 39% of the South Africans and 65% of the Ghanaians report that they were never outside of their compound or yard during the last week, about a third of the urban poor in our sample in Johannesburg and Accra report leaving their homes more than once during that period (Fig. 4). Households in both Johannesburg and Accra were officially only allowed to leave their compounds for essential services: food and medicine. Even more worrying, 25% of respondents in South Africa, and 38% of respondents in Ghana report that they did not avoid large gatherings during lockdowns. Only a minority report that they were able to maintain a safe distance of one meter from other

<sup>7</sup> Question asked was "Which of the following statements reflects your daily behavior over the past seven days?"

people when leaving the house (24%) or avoiding public transport (11%) (data only available for Ghana). The major obstacles to following social distancing guidelines (open question later in the survey) that people report are that they need to take public transport (29%), they have shared toilet facilities with other households (23%), they cannot afford to lose income (17%), or they live in a crowded or single-room home (17%, see also Table 1). Indeed, sharing toilet facilities is a major problem in poor urban neighborhoods in Ghana. Only 34% of households have their own toilet; more than

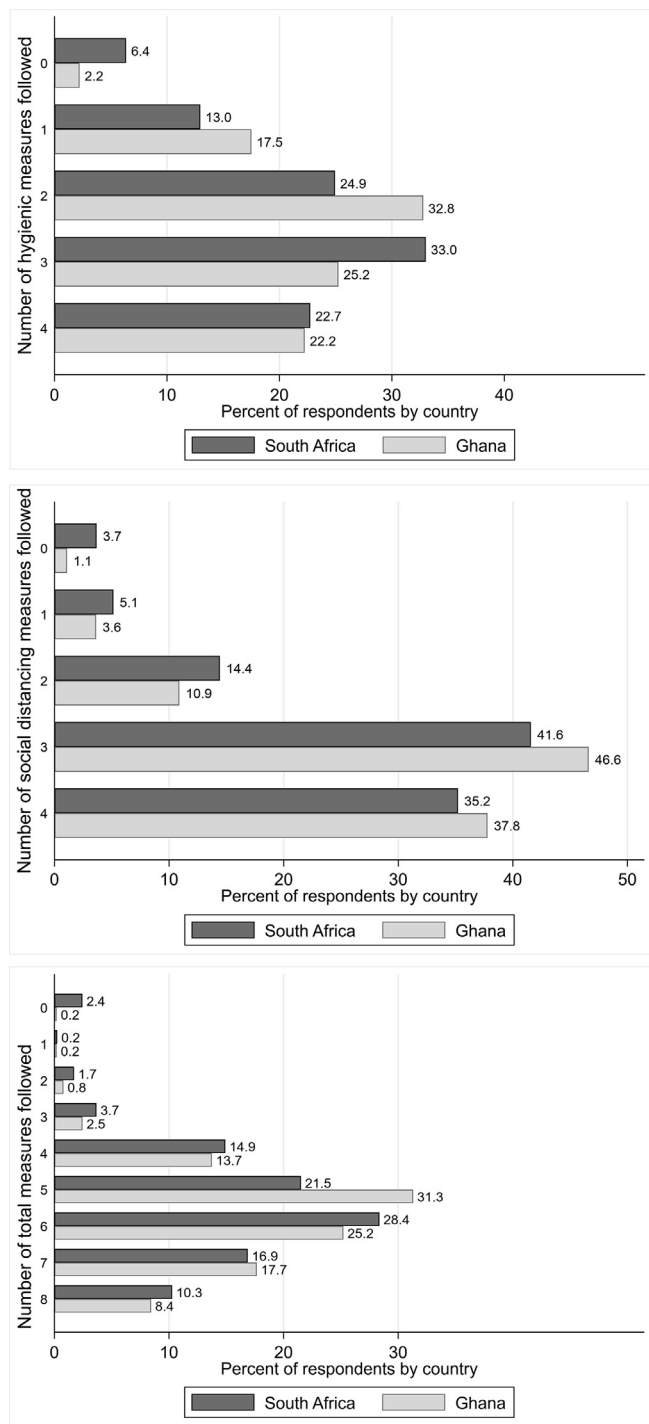
30% of the households share a toilet with more than nine other households.

Respondents follow around 2.5 out of the four hygienic measures, three out of the four social distancing measures, and 5.5 out of all eight measures in both South Africa and Ghana (Fig. 5). Hence, cooperation or compliance with governmental regulations is equally high in both countries, despite much stricter governmental regulations in South Africa. However, the standard deviation of measured compliance is larger in South Africa than in Ghana. This becomes apparent in Fig. 5, which shows that most Ghanaians adopt five to six protective measures, whereas the range of the total number of measures taken is wider among the urban poor in South Africa. Interestingly, a simple correlation matrix of different measures in Table A1 in the Appendix indicates that while hygienic and social distancing measures are perceived as (weak) complements in South Africa, they are perceived or executed as (weak) substitutes in Ghana. In Ghana, individual hygienic measures are weakly negatively correlated with the total number of social distancing measures taken. This result could also indicate that individuals for whom it is very difficult to comply with social distancing (for example, those working in an informal job, living in crowded housing, or sharing sanitation) engage more in preventive hygienic measures (see also Table 3).

#### 4.3. Knowledge of COVID-19 early into the pandemic

For an individual to take the correct actions to mitigate the risk of COVID-19 infection (see Section 4.2), they need access to accurate and reliable information. Given the novelty of COVID-19, there is still uncertainty in the scientific community about the pathways of infection, symptoms, and protective measures against the virus, fueling opportunities to spread misinformation (WHO, 2020b; Wanga et al., 2020; De Witte, 2020). Therefore, organizations such as the WHO, national governments, and NGOs have tried to curb the spread of misinformation about the virus. Almost all people in Ghana (99.8%) and South Africa (96%) have heard of the Coronavirus. To get an indication about lack of information or even misinformation among the urban poor, we ask the respondents in both samples how many people in their country have tested positive for COVID-19 on the specific day they were interviewed. In Ghana, 48% of respondents and 41% in South Africa estimate the answer within 20% of the official number of cases recorded on the corresponding day, which was between 1,279 and 2,074 in Ghana<sup>8</sup> and between 2,506 and 9,420 in South Africa.<sup>9</sup> About 25% of the participants in both countries said they do not know the answer and are hence uninformed. The remaining 28% in Ghana and 35% in South Africa, who did not give an answer within 20% of the actual rate, can be classified as misinformed. As shown in Fig. 6, people are more likely to underestimate than overestimate the number of COVID-19 cases in their country. For Ghana, we additionally ask respondents about the COVID-19 case fatality rate. Only 49% of the total sample are able to give any answer, but almost everyone (97%) that indicated they knew the answer, answers within 10% of the official number (0.8%). The other 2% extremely overestimate the likelihood of dying by estimating case fatality rates higher than 10%.

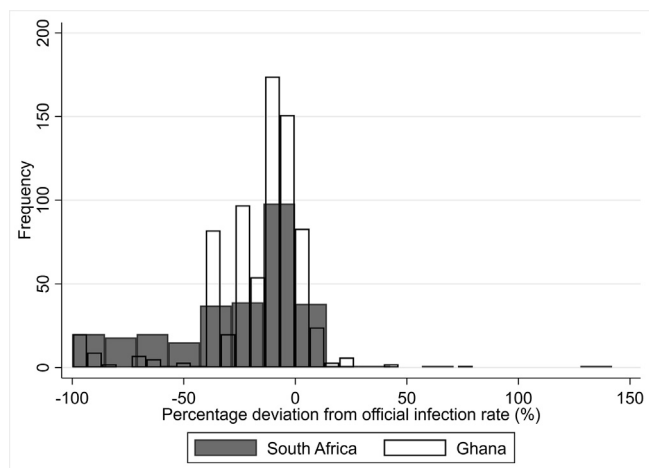
The WHO lists fever, tiredness, and dry cough as the most common symptoms and difficulty breathing as a serious symptom (WHO, 2020c). Less common symptoms include aches and pains, loss of taste or smell, nasal congestion, runny nose, sore throat, headache and diarrhea. The South African Health Department lists coughing, fever, shortness of breath and sore throat as the core symptoms (Department of Health, 2020). The core symptoms com-



**Fig. 5.** Number of hygienic and social distancing measures followed  
 Note: Hygienic measures include: always wear face mask in public, always wash hands with soap, avoid shaking hands, avoid touching surfaces. Social distancing measures include: no visitors, do not visit someone, only leave home for food, avoid large gatherings.

<sup>8</sup> From April 23–30, 2020.

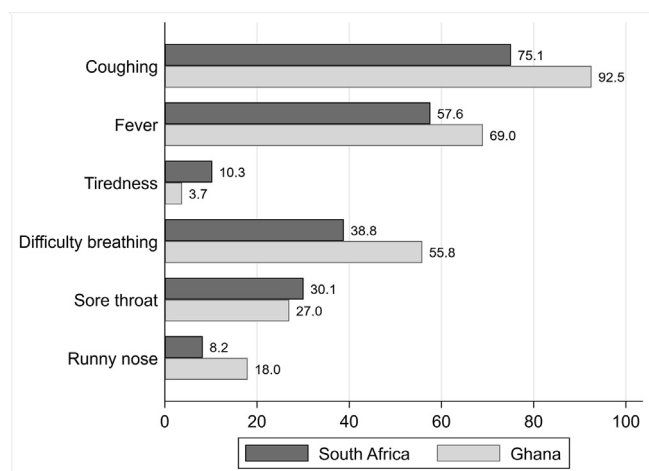
<sup>9</sup> From April 16 to May 09, 2020.



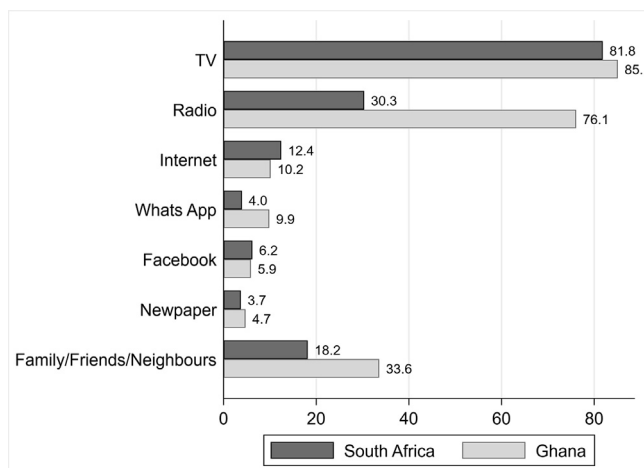
**Fig. 6.** Estimated infection rates of COVID-19 in Ghana and South Africa  
 Note: The percentage deviation from the daily official infection rate is shown excluding outliers >150%.

municated by the official Ghana Health Service include coughing, fever, headache, sore throat, and runny nose (GHS, 2020). We ask respondents an open question to name the symptoms of COVID-19. On average, respondents from both countries mention around three of the 10–15 symptoms recognized by the WHO. Coughing is mentioned most often (by about 4 out of 5 people), followed by fever and difficulty breathing (by about 1 in 2), and sore throat (by about 1 in 3) (Fig. 7). In general, people in Accra are able to mention more common symptoms than people in Johannesburg (Fig. 7). About 5% of South Africans and Ghanaians mention none of the core symptoms. The WHO recommends seeking medical attention when experiencing difficulty breathing. Although the South African Health Department communicated this as a core symptom to the public and the Ghana Health Services did not, South Africans are less likely to mention it than Ghanaians.

When asked to report what they would do if they experience symptoms, 69% in Ghana say they would go to the clinic right away (which they should not), 39% would call the toll-free hotline (as recommended by the Ghana Health Service), 13% would call a doctor, 13% would get tested, 10% would pray, and 8% would stay at home (multiple answers possible, not asked in South Africa). None of the respondents mention that they would drink alcohol in case



**Fig. 7.** Symptoms of COVID-19 in sample from South Africa and Ghana  
 Note: Question, “What are the symptoms of Coronavirus?” Respondents could answer multiple symptoms.



**Fig. 8.** Where people get their information  
 Note: Question, “What kind of media have they used?” Multiple answers possible.

they feel light symptoms, which is a misperception identified by the WHO (2020b). Only 0.5% of the respondents say that they would not tell anybody that they feel symptoms.

Lastly, we also ask where the urban poor get their information, in order to find ways to improve information flows from science and policy to the public (see Fig. 8). In line with research in other low-income countries, such as Kenya, Senegal, South Africa, Benin, Bangladesh (Aushian & Abuya, 2020; Le Nestour et al., 2020; Elliott, 2020; BRAC, 2020), more than 80% of people in South Africa and Ghana inform themselves by watching TV. Other important information sources are radio (30% in South Africa and 76% in Ghana) and, in Ghana, social contacts from family, friends, and neighbors (around 34%). In both countries, very few people get information from social media or the newspapers.

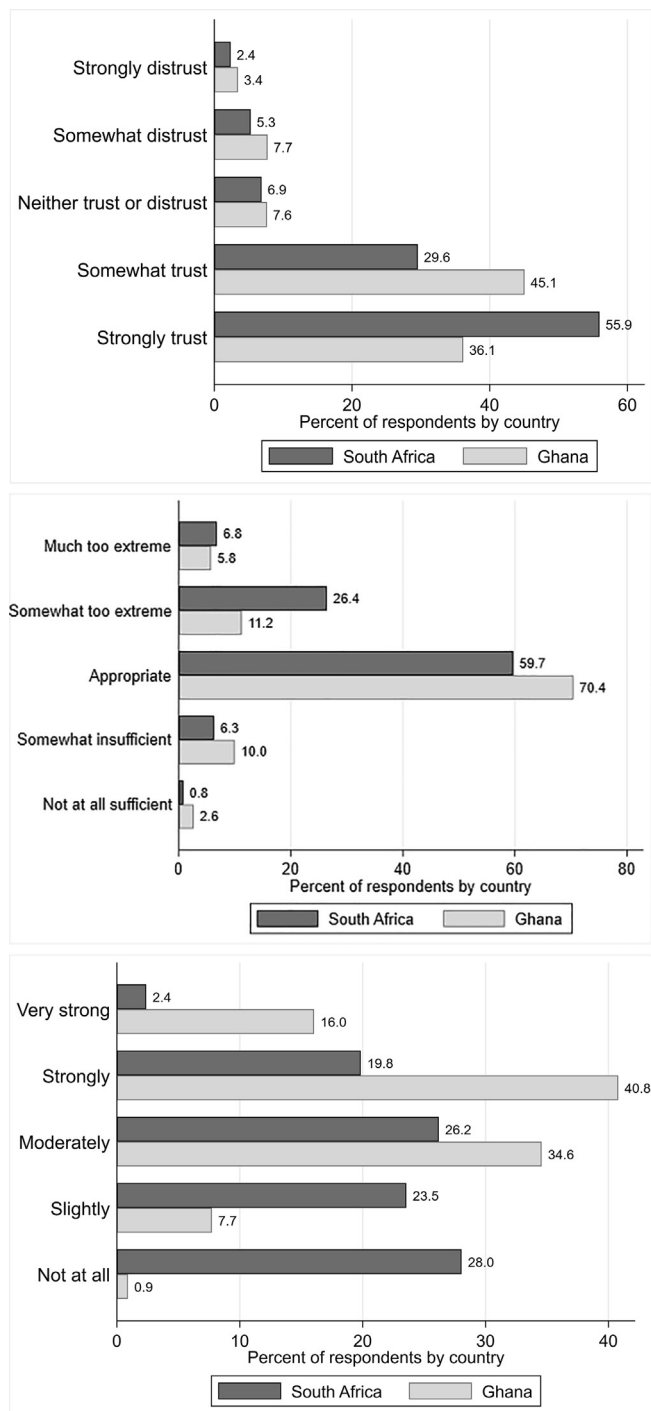
#### 4.4. Perception of the governments' actions

It is important to understand if people trust the government, if they think governmental regulations are appropriate, and if they received any mitigation measures by the government, such as free food, water, or electricity. These interactions with the government can influence the readiness of poor populations to cooperate and change their behavior during lockdowns and beyond (Egger et al., 2020). In South Africa, 86% of respondents and 81% of Ghanaian respondents say they trust the government somewhat or strongly to take care of its citizens (Fig. 9). Despite high levels of trust in the government, 33% of South Africans say the measures implemented to stop the virus were (somewhat or much) too extreme and 28% say that the lockdown was not enforced at all in their neighborhood (Fig. 9). In comparison, with similar levels of trust in the government, only 17% of Ghanaians report that their government's actions were too extreme and only 1% of Ghanaians report that the rules had not been enforced in their neighborhoods (see Fig. 9).

In South Africa, the government announced only at the end of April 2020 that they would make a R500 billion stimulus package available for various expenditures, such as emergency funds for food aid, small businesses, supplementary income, water, and electricity (CNBC Africa, 2020). In contrast, the Ghanaian government implemented many support programs already at the beginning of the lockdown in March 2020, including special life insurance and tax breaks for health personnel, three months of free water and electricity for the poor with subsidized bills for the middle class, water tank service to all vulnerable communities, and free food



distribution. Only a few respondents in our survey actually report benefiting from the free food distribution (9%) and/or using the water tanks (4%). The main reason why people say they did not use the water supplied by the tanks is that it was not available in their neighborhoods (80%). Almost all respondents report receiving a free water bill and/or reduced electricity bill.



**Fig. 9.** Perception about government’s action in the sample from South Africa and Ghana. The questions asked in the above graphs are, from top to bottom: “How much do you trust the government to take care of the people of South Africa/Ghana?”; “What do you think about the government’s actions to curb Coronavirus? Is it appropriate, too extreme or not sufficient?” and “The government has announced a lockdown to combat the spread of the Coronavirus, how strongly is it enforced in your neighborhood?”.

#### 4.5. Drivers of social distancing and preventive hygiene

Finally, by combining Sections 4.1–4.4 we analyze correlates of behavioral change during the lockdowns. These correlations could indicate possible ways to foster compliance with social distancing and preventive hygiene guidelines to minimize the spread of COVID-19 and to avoid another lockdown of public life, which has immediate severe negative consequences on the lives of the urban poor (see Section 4.1). Table 3 presents a first preliminary regression that shows which attributes are correlated with a higher number of reported preventative actions (as shown in Figs. 4 and 5).

For Ghana, knowledge of COVID-19 case counts has a significant impact on reported mitigation measures. For the South African sample, people with higher trust in government are more likely to be engaged in behavioral change (similar to Fetzer et al., 2020). For both countries, respondents that perceive the government’s measures as too extreme are more likely to report that they engage in fewer hygienic protective measures, however, they are also less likely to go outside their compounds. Anxieties about the future are not correlated with reported social distancing and/or hygienic measures. Older populations are more likely to follow social distancing regulations (but not hygienic measures) in both countries. Education and gender do not seem to play a large role in protective behavior. People in crowded houses (with children), as well as households whose income depends on a salary, are more likely to leave their compounds more often despite the curfews in both countries, but reportedly adopt more hygienic measures.

### 5. Discussion and conclusion

The global COVID-19 pandemic is manifesting differently in every country. Given each country’s level of international connectivity in terms of air travel and trade, every country initially had a different risk of an outbreak (Gilbert et al., 2020; Martinez-Alvarez et al., 2020). Due to variations in the medical capacity to handle the pandemic as well as differences in underlying health issues and demographics, the health impact of COVID-19 will not be the same in each country. What is the same for all countries is that without widespread access to a new vaccine, the most effective way to limit the spread and impact of the virus is to practice social distancing and preventive hygiene – especially in densely populated neighborhoods where the virus could spread quickly. Such measures depend on the willingness and ability of the population to cooperate and engage in behavioral change. These practices are now becoming more relevant in African countries, where many governments had to lift or ease national lockdowns of public life despite rising numbers of COVID-19 cases due to the detrimental economic effects of lockdowns on poor populations.

Various previous studies already show that, as of today, the pandemic has had a larger economic than health impact on people living in poverty (Aushian & Abuya, 2020; BRAC, 2020; HSRC, 2020; Kesar et al., 2020; Le Nestour et al., 2020; Malik et al., 2020; Rahman & Matin, 2020; Sumner et al., 2020). This outcome also seems to be the case for the urban poor in Accra, where many people are dependent on their own business in the informal economy. The lockdown immediately lowered the incomes of the urban poor and, importantly, at the same time led to an increase in food prices, which has to be taken into consideration when thinking about cash-transfer programs or providing free public services as remediation measures. In contrast to Ghana and many other low- and middle-income countries, the leading single source of income for the urban poor in South Africa are grants from the government, which are largely unaffected by the virus and lockdowns – at least so far. In this regard, South Africa already has a system in place to

**Table 3**  
Correlation with number of preventative actions.

	Number of hygienic measures followed (0–4)		Number of social distancing measures followed (0–4)		Number of times outside the compound (0–7)	
	South Africa	Ghana	South Africa	Ghana	South Africa	Ghana
<i>Knowledge</i>						
Number of estimated infected people is correct (less than 20% deviation)	–0.101 (0.305)	0.198*** (0.005)	0.114 (0.294)	0.0216 (0.700)	0.0343 (0.812)	0.130 (0.183)
Mention at least 2 out of 3 key symptoms (Fever, Coughing, Difficulty breathing)	–0.144 (0.154)	0.283*** (0.008)	0.165 (0.117)	0.209** (0.013)	–0.140 (0.327)	–0.147 (0.281)
<i>Perception government</i>						
Government reaction too extreme	–1.28*** (0.000)	–0.32*** (0.000)	–0.156 (0.157)	–0.0925 (0.188)	–0.472*** (0.004)	–0.299** (0.023)
Distrusts the government	–0.482*** (0.005)	–0.159 (0.147)	–0.450** (0.019)	–0.149 (0.121)	0.650** (0.032)	–0.105 (0.407)
Lockdown was strongly enforced	–0.187 (0.208)	0.359*** (0.000)	0.116 (0.385)	0.0124 (0.817)	0.205 (0.303)	–0.0166 (0.859)
<i>Anxieties about future</i>						
Strongly worried about lower income of my household	0.190* (0.068)	0.122 (0.126)	0.100 (0.395)	–0.0950 (0.148)	0.0535 (0.700)	0.0978 (0.366)
Strongly worried about not getting enough food in the near future	0.0692 (0.484)	–0.005 (0.952)	0.101 (0.293)	–0.118 (0.158)	–0.242* (0.077)	0.188 (0.171)
Strongly worried about the health of my family	–0.265** (0.016)	0.239*** (0.005)	–0.165 (0.105)	–0.0623 (0.367)	–0.160 (0.254)	–0.0166 (0.885)
<i>Socioeconomic and household factors</i>						
Age 30–39 (Reference: 18–29 years)	–0.166 (0.230)	–0.00848 (0.957)	0.236 (0.134)	0.179 (0.159)	–0.499** (0.035)	–0.260 (0.246)
Age 40–49 (Reference: 18–29 years)	–0.0785 (0.581)	–0.0425 (0.788)	0.386** (0.014)	0.315** (0.014)	–0.802*** (0.001)	–0.408* (0.069)
Age 50–59 (Reference: 18–29 years)	–0.213 (0.188)	–0.185 (0.252)	0.197 (0.261)	0.266** (0.041)	–0.497* (0.058)	–0.466** (0.039)
Age 60–69 (Reference: 18–29 years)	–0.0999 (0.633)	–0.131 (0.466)	0.431** (0.020)	0.300** (0.028)	–0.720*** (0.009)	–0.340 (0.163)
Age 70+ (Reference: 18–29 years)	–0.457 (0.128)	–0.328 (0.131)	0.560** (0.037)	0.560*** (0.000)	–0.734** (0.023)	–0.560** (0.044)
Female (Reference: Male)	–0.0438 (0.694)	0.0377 (0.590)	0.129 (0.257)	0.0537 (0.346)	–0.380** (0.021)	0.0601 (0.534)
Primary Educ. (Reference: no school)	0.250* (0.086)	–0.133 (0.349)	–0.0909 (0.502)	–0.145 (0.295)	0.394** (0.027)	0.0795 (0.653)
Secondary Educ. (Reference: no school)	0.161 (0.351)	–0.0276 (0.801)	0.00472 (0.977)	–0.0224 (0.814)	–0.143 (0.488)	0.301** (0.036)
Tertiary Educ. (Reference: no school)	0.0286 (0.897)	0.317* (0.056)	–0.304 (0.200)	–0.0637 (0.642)	0.0933 (0.764)	0.588** (0.009)
Have children at home (Reference: no children)	–0.0968 (0.354)	0.141** (0.043)	–0.108 (0.344)	–0.156*** (0.005)	0.132 (0.407)	0.299*** (0.002)
Persons per room	–0.0392 (0.600)	0.059*** (0.000)	0.108 (0.122)	–0.04*** (0.001)	–0.148 (0.104)	–0.0279 (0.121)
Income from grants	–0.177 (0.117)	0.371* (0.058)	0.0126 (0.917)	–0.146 (0.289)	–0.105 (0.484)	–0.0398 (0.847)
Income from salary	0.251** (0.032)	0.271*** (0.007)	–0.137 (0.226)	0.0623 (0.442)	0.476** (0.010)	0.197 (0.190)
Self-employed	0.151 (0.516)	0.312*** (0.000)	–0.368 (0.171)	0.00991 (0.876)	0.517 (0.286)	0.142 (0.191)
Constant	2.201*** (0.000)	2.385*** (0.000)	2.807*** (0.000)	1.055** (0.044)	1.093 (0.054)	3.184*** (0.001)
Observations	385	993	385	993	374	915
R-squared	0.413	0.144	0.128	0.112	0.194	0.072

Note: P-values in parentheses: \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. In addition, in all regressions we controlled for the binary variable indicating if a person is stressed when leaving the house as well as the day of the interview since the 100th case.

disperse income to those in need during the lockdown, from which other countries could learn. South Africans, however, are still anxious about their future economic situation: the concern might rather be the fiscal capacity of the state to sustainably finance grants given the impact of the global pandemic and the increased probability to remain or become unemployed. The somewhat smaller direct effect on poor people’s income in South Africa than in Ghana might be the reason why the South African government was able to maintain a strict lockdown of public life (except for essential services) for more than 10 weeks, whereas the lockdown only lasted three weeks in Ghana.

Even if the main source of income in South Africa, grants from the government, was relatively unhindered by the pandemic, and the lockdown was only implemented for a limited time in Ghana, we find very high levels of anxiety. Most anxieties are about individuals’ economic situation (48% Ghana, 67% South Africa), followed by their family’s health (37% Ghana, 51% South Africa), and to a lesser extent, mobility (24% Ghana, 34% South Africa are stressed when leaving their homes). Hence, the South African sample is more worried about the impact of COVID-19, which is also reflected in 51% of South African and 37% of Ghanaian respondents saying that they feel depressed or hopeless. On a scale from zero to

ten, South Africans report a general satisfaction in life of 3.6, while Ghanaians report a score of 5.7.

Last, the impact of school cancellations is a major issue in Ghana and South Africa – as in many other countries. First, more than half of the households in our sample have schoolchildren at home compared to a third of households in high-income countries. The pressure is exacerbated due to small or single-room homes and parents with a low level of education not always in the position to support their children with formal learning. The children being at home is a challenge reported by many, especially in South Africa. Moreover, there is a big concern that children are falling behind. In South Africa, 37%, and 17% in Ghana report that their school-age children did not study or read the day before the interview. In addition, 71% of South African children and 46% of Ghanaian children used to receive food at school, which they no longer receive since schools closed. It is imperative that governments focus on a safe and secure way to reopen schools, not only to reduce pressure on households, but also to ensure children do not fall behind in learning and nutrition.

Lockdowns, therefore, have had a large but different negative impact on the economic, mental, and social well-being of the urban poor in Ghana and South Africa. However have the lockdowns been effective in changing the behavior of a significant portion of the population to curb the spread of COVID-19? If yes, how can African governments, not only in South Africa and Ghana, encourage and enable people to voluntarily follow social distancing and improve personal hygiene practices in the near future?

Interestingly, whereas the impact of the lockdown was different for Ghana and South Africa, the mitigation measures taken by the population were very similar. During the lockdowns and early into the pandemic, the most common reported way in which people mitigate their risk of infection in both countries is by frequent hand washing (80–90%), similar to studies done in urban poor areas around Nairobi (Aushian & Abuya, 2020), avoiding private gatherings (80–90%), and avoiding hand shaking (70–75%). All these measures come at a low financial cost and are relatively easy for families to implement. About 50% of the sample in both countries reports wearing a mask in public even before it was mandatory. However, about one third still attended larger gatherings of people, and/or left the home more than once per week, and 10–20% of households still received guests at home or visited others, even during strict curfews. A challenge with staying at home is both crowded housing and the need to earn an income. When leaving the house, keeping a one-meter distance in public appears to be a large challenge, mainly due to the need to use public transportation and public toilets (for the case of Ghana). In total, people already follow 2.5 (out of four) hygienic and three (out of four) social distancing measures in both countries. There is also some first (weak) indication from Ghana that hygienic measures are used as a substitute if social distancing is too costly for families. Hence, the urban poor seem to be willing to cooperate in social distancing and personal hygiene, but might not always have the infrastructure to do so – a point of intervention for governments and the international community.

Interestingly, people in South Africa are not more likely to follow social distancing rules (three out of four) despite stricter regulations, which has also been reported by the South African media, especially in densely populated informal settlements (Simelane, 2020; Ishmail, 2020). Our results indicate that the reasons are generally lower enforcement in Johannesburg's neighborhoods, as compared to Accra's, and that the South African population considers governmental policies too extreme. Moreover, people with low trust in government are also less likely to comply. Even if we cannot test this directly, a notable difference between Ghana and South Africa is that Ghana put special measures for poor populations in place at the start of the lockdown:

free water and electricity, from which most of respondents in our sample benefited. Special governmental remediation only happened with a delay in South Africa. Interestingly, anxieties about future income and health do not seem to play a major role in cooperative action.

As the effectiveness of governmental regulations depends on the cooperation of the public, the South African government could reassess the future stringency of lockdown regulations, given the low levels of enforcement and the high cost to poor families' well-being. Instead, officials can focus on better informing the population both about COVID-19 and the reasons behind their actions, two strategies that seem to have contributed to less social interaction and/or more hygienic behavior in Ghana.

Lastly, we find that a considerable share of the population in both countries still lacks important information, the good news being that people do not currently seem to be misinformed. Similar to recent surveys in low-income countries, almost all of the respondents have heard of COVID-19 (Aushian & Abuya, 2020; Elliott, Roy et al., 2020). About 50% in both countries know how many people are infected (within 20% of the official case numbers on a specific day). People who are misinformed tend to underestimate the number of cases. In addition, participants can identify about three of the symptoms recognized by the WHO. However, only about 50% of the sampled populations know that fever and difficulty breathing are core symptoms and only 40% say they would call the recommended toll-free number if infected (in Ghana). Most others would directly go to the hospital and/or stay at home. To increase understanding about core symptoms among the population, our results suggest that it makes sense to invest in TV information campaigns for both countries and also in radio campaigns in Ghana. Most people in South Africa and Ghana inform themselves by watching TV, which is similar to studies done in Kenya, Senegal, Nigeria and Bangladesh (Aushian & Abuya, 2020; BRAC, 2020; Elliott, 2020; Le Nestour et al., 2020). Interestingly, only a few people get information on social media, much less than in countries such as Nigeria and Kenya (Elliott, 2020), which might help to reduce misinformation even if information spreads at a slower speed.

To conclude, mass cooperation is the most effective way to curb the spread of COVID-19: a large percentage of the population needs to keep a safe distance from others and maintain proper personal hygiene. Although strict lockdowns increase the amount of reported social distancing and hygiene practices, we have shown, similar to other studies, that it comes at an extraordinarily high cost to the urban poor – even if the scale of the impact varies across countries or cities, as seen in Accra and Johannesburg. Moreover, even during lockdowns, a considerable share of the urban poor does not comply with regulations. Governments might be able to mobilize cooperation by investing in both the necessary public infrastructure (such as free water or better public transportation) and information campaigns, both about COVID-19 and their policies to confront it.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Acknowledgements

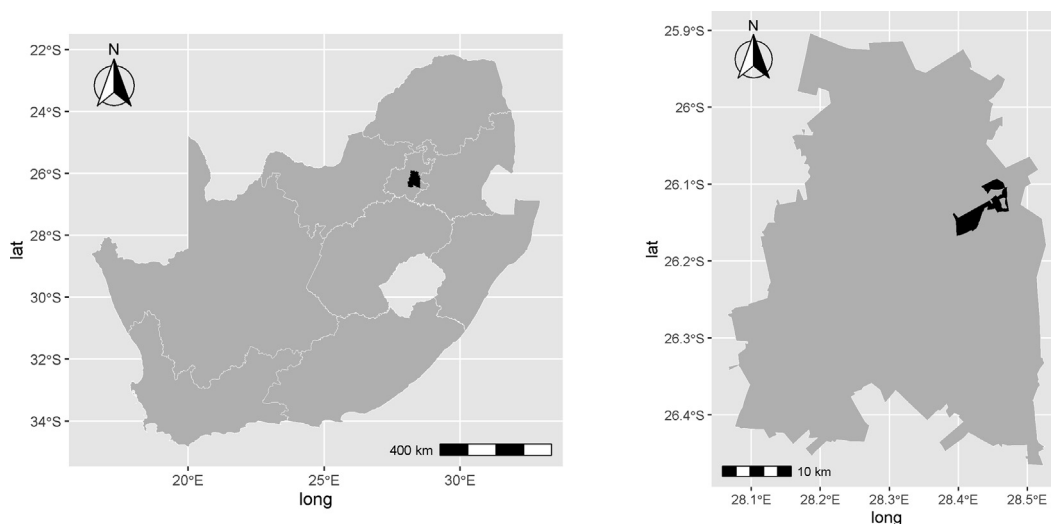
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Appendix

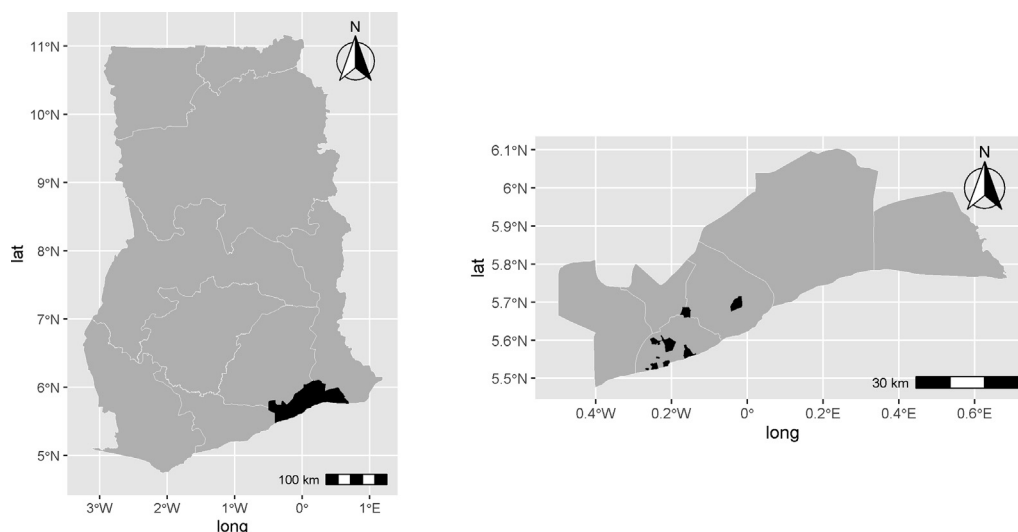
**Table A1**  
Correlation Matrix of individual measures followed in South Africa and Ghana.

Number of followed measures		Always wore face mask in public	Always wash hands with soap	Avoid shaking hands	Avoid touching surfaces	Had no visitors	Did not visit someone	Left home not more than once	Avoided gatherings
South Africa	Hygienic measures	0.271	0.377	0.450	0.196	0.051	0.039	-0.163	0.426
	Social distancing measures	0.057	0.113	0.023	0.174	0.377	0.398	0.128	0.000
Ghana	Hygienic measures	0.366	0.040	0.258	0.385	-0.113	-0.144	-0.251	0.227
	Social distancing measures	-0.065	-0.011	-0.080	-0.059	0.225	0.305	0.136	-0.126

Note: The number of total hygienic and social distancing followed excluded for each correlation with an individual measure the specific measures, e.g. for the correlation of hygienic measures and avoid shaking hands, the sum is maximal 3 not 4 since avoid shaking hands was excluded.



**Fig. A1.** Map of study area in South Africa  
Note: The left panel in the graph above shows all nine provinces of South Africa, black highlighted the municipality of Ekurhuleni in the province Gauteng where the two neighborhoods are located. In the right panel, the two neighborhoods Etwatwa and Daveyton are highlighted in black.



**Fig. A2.** Map of study area in Ghana  
Note: The left panel in the graph above shows all ten regions of Ghana, black highlighted the region Greater Accra where the 18 neighborhoods are located. Ghana reorganized the 10 regions into 16 regions in 2019. Since the official shape files are not yet available and the boundary stayed the same for Greater Accra, the old boundaries are shown in the graph. In the right panel the region Greater Accra with the six districts are shown. In red 16 neighborhoods are highlighted. Pig Farm and Ablekuma are not yet included since the boundaries were not yet confirmed by the statistical department.

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