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Inequalities, Exclusion and COVID-19 in Sub-Saharan Africa

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Inequalities, Exclusion and COVID-19 in Sub-Saharan Africa*

Raymond Boadi Frempong[1], Jacob Novignon[2], David Stadelmann[3]

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Abstract

Since the outbreak of the COVID-19 crisis, there is an increased interest to understand how social inequalities, discrimination, and inclusion are related to the pandemic. Sub-Saharan Africa has been comparatively resilient regarding the number of cases and fatalities per capita. At the same time, the region has high rates of multiple inequalities. Socioeconomic inequalities could adversely affect the fight against COVID-19 by influencing people's access to healthcare and eroding confidence and trust in public health institutions. This work investigates the effects of education, gender, income, and political inequalities on COVID-19 in Sub-Saharan Africa. The study also explores a country case study from Ghana to complement the systematic regional analysis. We find that pre-existing income inequality, along with some other dimensions of inequality, may have contributed to higher infection and mortality rates of COVID-19. We recommend that in the short-term governments should consider outcomes of inequality in their fight against COVID-19. In the medium and long-term, and for the effectiveness of measures to fight future outbreaks, governments should strive to reduce various forms of inequalities.

Keywords: COVID-19, Inequality, Sub-Saharan Africa

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[1] Dr. Raymond Boadi Frempong (corresponding author): University of Bayreuth, Germany, Africa Multiple Cluster of Excellence.

[2] Dr. Jacob Novignon: Department of Economics, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

[3] Prof. Dr. David Stadelmann: University of Bayreuth, Germany, Africa Multiple Cluster of Excellence, BEST - Centre for Behavioural Economics, Society and Technology, IREF - Institute for Research in Economic and Fiscal Issues, Ostrom Workshop at Indiana University, and CREMA - Center for Research in Economics, Management and the Arts.

I. INTRODUCTION

Since the outbreak of COVID-19, there has been increased interest to understand how inequalities, discrimination, exclusion, and multiple socioeconomic factors are connected to the crisis (García, 2019; Mollalo, Vahedi, & Rivera, 2020; Oronce, Scannell, Kawachi, & Tsugawa, 2020). Inequalities have been shown to have influenced infection rates in previous pandemics (Rutter, Mytton, Mak, & Donaldson, 2012). In some countries, available data suggest that the COVID-19 virus has disproportionately affected the poor and the marginalised (APM Research Lab, 2020). Among the possible causes of this situation is the unequal distribution of economic and health resources (Stiglitz, 2020). In South Africa, which is also the worst-hit country in Africa, similar arguments have been made regarding the role of inequality and the spread of COVID-19 (Cocks, 2020) and this also applies to India (Pai, 2020).

Sub-Saharan Africa is highly unequal regarding income distribution, with 10 of the top 19 unequal countries in the world located in the region (Odusola, Cornia, Bhorat, & Conceição, 2017). Inequality in Sub-Saharan Africa has several dimensions ranging from the distribution of income and economic resources to access to infrastructure. Access to social and political power tends to be concentrated in the hands of relatively few such that power tends to be monopolised. This may further worsen the effect of existing income inequality on the societal outcomes of the people. Inadequate access to quality education may limit the ability of those at the bottom to escape poverty. The lack of access to economic opportunities has been linked to the emergence of urban slums which lack essential services and sanitation facilities in most African cities.

There are several ways by which inequalities can affect the spread of and mortality from infectious diseases. Economic hardship influences people's behaviour in ways which may fuel the spread of the disease. Income inequality, in particular, has been linked to risky lifestyle, poor nutrition and diabetes (Bachmann et al., 2003; Bilger, Kruger, & Finkelstein, 2017; Hosseinpoor, Parker, Tursan d'Espaignet, & Chatterji, 2012; Pickett, Kelly, Brunner, Lobstein, & Wilkinson, 2005). Deprived individuals often live in crowded areas where pandemic response measures, including social distancing, are difficult to achieve. In most African settings, crowded open markets and transportation systems serve the poor and the deprived and provide the livelihood of these people. Hence, restricting activities and movements in these areas threatens their livelihood. Moreover, low-income individuals are often engaged in the provision of essential, but high risk, services which expose them to COVID-19 (Oronce et al., 2020). Given these challenges, most African countries seem to have coped relatively well so far with the direct health consequences of COVID-19.

Socioeconomic inequalities could also adversely affect the fight against COVID-19 by eroding confidence and trust in public institutions. During pandemics, trust in public institutions, especially health-related institutions, counts as necessary social capital to curb the spread (Chan et al., 2020). Inequalities can have a multidimensional effect on public health outcomes. First, they affect access to health care (López, Loehrer, & Chang, 2016; Yaya, Bishwajit, & Shah, 2016), public health compliance, and the ability of governments to mobilise the sense of community and nationalism among its citizens to combat the disease (van Bavel et al., 2020). In Sub-Saharan Africa, where

power and associated corruption already affects healthcare delivery and the quality of health facilities (Onwujekwe et al., 2019; Hsiao, Vogt, & Quentin, 2019), lack of trust could pose a significant challenge in the fight against COVID-19.

Apart from age, the risk of severe COVID-19 and hospitalisation is higher when the patient has an underlying health condition (Clark et al., 2020). Some of these conditions, such as obesity (Peres, Riera, Martimbianco, Ward, & Cunha, 2020), may not be prevalent in Sub-Saharan Africa; however, poverty and inequality-linked diet-related health conditions such as diabetes are prevalent (Azevedo & Alla, 2008). As the continent with the highest case of HIV/AIDS, especially among the poor, these prevalent conditions add an extra layer of complications and complexity to the COVID-19 situation.

We examine the link between Covid-19 and different types of inequalities and inclusion in Sub-Saharan Africa. Apart from the age and underlying medical conditions, environmental and economic factors have been cited to affect the severity of the disease and the number of infections (Finch & Hernández Finch, 2020; Ahmad et al., 2020; McFarlane, 2020). Individuals in the lower strata of the income distribution and those affected by different types of exclusion may be more likely to suffer the devastating effect of the disease. However, juxtaposing these predictions with the comparatively low infection and mortality rates in Sub-Saharan Africa raises the need for further research on the subject to understand the relationship between the pandemic and inequalities within Africa taking into account the multiple dimensions of the disease and the countries affected. This study aims to broaden the understanding of COVID-19 in the sub-region by exploring the role of inequalities on COVID-19 reported infections and fatalities in the region.

Specifically, we conduct an explorative study on the relationships of education, gender, income and political inequalities on COVID-19 infections and mortalities in Sub-Saharan Africa and employ methods to take systematic account of the multiplicity of the situation. We employ descriptive and multiple regression analysis to examine the relationship between each of the multiple dimensions of inequality and COVID-19. We find that higher income inequality (measured by the Gini coefficient) has the potential to increase both infections and mortality cases. Additionally, we observe that education and gender equality are marginally associated with lower COVID-19 cases. Indeed, our results show that income inequality may have some explanatory power in the multifaceted COVID-19 pandemic situation in the sub-regions but once taking account of multiple other relationships the link of income inequality as of other types of inequality tends to become statistically insignificant. The regional findings have amplified an assessment of the case of Ghana. It is noted that the most affected regions have vulnerable populations with poor socioeconomic conditions that were unfavourable for the fight against the pandemic. Nevertheless, the favourable age structure (Frempong, Stadelmann, & Wild, 2020) and quick responses at the start of the crisis, may have helped to keep the direct health burden of the disease relatively small in comparison to other countries.

II. DATA, METHOD AND DESCRIPTIVE STATISTICS

Data and variables

COVID-19 Infections and Fatalities

We analyse the relationship between COVID-19 and inequalities using data from several sources. Data on COVID-19 infections and fatalities are obtained from the European Center for Disease Prevention and Control (ECDC). This data is collected by the ECDC daily from the official government of the various countries (ECDC, 2020). Our sample includes all officially reported COVID-19 infections and fatalities from February 2, 2020 to August 31, 2020. After data cleaning, we obtained a sample of 46 African countries for the analysis. In the analysis, we work with both the total number of infections and fatalities per hundred thousand people. We investigate several types of inequality individually and jointly, thereby implicitly taking account of the intersectional relationship between different variables through our methods and analytical strategy.

Explanatory variables

(i) Income inequality

We measure income inequality with the Gini coefficient. The Gini variable is obtained from the World Income Inequality Database (WIID), published by the UNU-WIDER. The Gini is a representative composite measure intended to represent the income distribution within a country. It ranges between 0-1 (0-100), where 0 is an entirely egalitarian distribution, and 1 is the case when all income is concentrated in a single person (UNU-WIDER, 2020). In the analysis, we use the average Gini score from 2010-2018.

(ii) Gender inequality index

The gender inequality index (GII) is obtained from the Human Development Report. The index is widely used and tracks aspects of human development: (i) reproductive health, measured by maternal mortality ratio and adolescent birth rates; (ii) empowerment, measured by the proportion of parliamentary seats occupied by females and proportion of adult females and males aged 25 years and older with at least some secondary education and; (iii) economic status, expressed as labour market participation and measured by labour force participation rate of female and male populations aged 15 years and older (UNDP, 2019). A higher GII value connotes more disparities between females and males in terms of human development.

(iii) Access to quality education

This variable is obtained from the 2020 Social Progress Index (Social Progress Imperative, 2020). It represents an aggregate evaluation of country experts on the extent to which high-quality basic education is guaranteed to all, sufficient to enable them to exercise their fundamental rights as adult citizens. The variable is measured on a 0-4 scale where 0 denotes the case when the provision of high-quality basic education is unequal (at least 75 per cent (%) of children receive such low-quality education that undermines their ability to exercise their basic rights as adult citizens). Four is when basic education is equal in quality (Stern, Krylova, & Harmacek, 2020).

(iv) Equality of political power by social groups

This is a measure of how political power is distributed among social groups in a country (Stern et al., 2020). It is measured on a 4-point scale where a value of 0 is when political power is monopolised by one social group in the country. A value of 4 means all social groups have roughly equal political power, or there are no strong ethnic, caste, linguistic, racial, religious, or regional differences. Thereby it accounts for further intersectional aspects when analysed jointly with other indicators. We obtained this variable from the social progress indicators (Social Progress Imperative, 2020). We use this variable to control for the sense of inclusiveness in the country. An earlier study by van Bavel et al. (2020) shows that people who have a strong association with their country are more likely to engage in sound public health behaviour and have greater support for public health policies.

(v) Demographic and health indicators

We include additional control variables for the population and health condition in the countries. The age structure of the country is included to control for the established and strong association between age and COVID-19 hospitalisation and mortality. We measure age structure by the percentage of the population who are at least 60 years old. Besides, we control for the existing health condition of the populace with life expectancy at birth.

(vii) Freedom of Corruption

Corruption affects the effectiveness of health institutions and healthcare delivery in a country (Elgar, Stefaniak, & Wohl, 2020; García, 2019; Naher et al., 2020). Corruption erodes confidence in public officials and ultimately, people's willingness to follow public health directives. To control for the effect of corruption, we include a measure of the perceived level of public sector corruption. We include perceived public sector corruption from Transparency International. The variable ranges from 0 worst level of corruption to 100 (no corruption).

(viii) Economic progress

Finally, general economic progress and performance, also influence the performance of health systems, the effectiveness of public health measures, and people's ability to access healthcare. There may also be other confounding variables which we do not directly control for because of our sample size and lack of data. We, therefore, include the logarithm of the country's per capita gross national income (purchasing power parity) to capture the aggregate effects of economic development on reported COVID-19 infections and fatalities.

Analysis and estimation strategy

We employ descriptive statistics and multiple regression analyses to uncover potential multiple relationships between the various inequalities and COVID-19 related fatalities and infections. First, we present the bivariate relationship between COVID-19 fatalities and infections separately with each of the inequality indices. Each relationship is represented by a graph and Pearson's correlation coefficient. Then we use multiple regression models to analyse the relationships of the various

inequality indicators on COVID-19 at the same time. The chosen method takes account of relational influences between the variables.

We estimate the following models where COVID-19 infections and deaths are explained by socioeconomic inequalities as well as other control variables:

$$Infection_i = \alpha + \beta_i Gini_i + \beta_2 Edu_i + \beta_3 GII_i + \beta_4 SocialPol_i + \boldsymbol{CONTROLS'_i \Theta_i} + \epsilon_i \quad (1),$$

$$Deaths_i = \lambda + \pi_1 Gini_i + \pi_2 Edu_i + \pi_3 GII_i + \pi_4 SocialPol_i + \boldsymbol{CONTROLS'_i \Omega_i} + \xi_i \quad (2).$$

$Infection$ is the total number of infections per hundred thousand people in a country, i. $Deaths$ is the total number of COVID-19 reported deaths per hundred thousand population. $Gini$ is the Gini coefficient, Edu represents our measure for equal access to quality education, GII is the gender inequality index, and $SocioPol$ measures access to political power by social groups. $\boldsymbol{CONTROLS}$ represents a matrix of all other variables to take account of relevant variables and alleviate endogeneity. While our approach accounts for relevant aspects of multiplicity and the potential relational structure of different indicators for inequality and inclusion, the present analyses do not allow for a direct causal claim due to remaining endogeneity.

Descriptive Statistics

Table 1 contains summary statistics of the variables we employ in the study. The average number of reported infections among the 46 countries is about 130.3 per every hundred thousand people with an associated mean fatality of 2.2 at the end of the data collection period (August 31, 2020). It is important to note that the reported number of infections is an underestimation of the actual number of infections as the number of reported cases depends heavily on testing, and as such, on testing capacity. Testing shortages matter comparatively more in Sub-Saharan Africa, due to a general scarcity of resources in the health system (Frempong, Stadelmann, & Wild, 2020). Uyoga et al. (2020) estimate that 1 in 20 adults in Kenya had SARS-CoV-2 antibodies by mid-June, while only 2093 cases were actually reported. This would suggest substantial undercounting of infections. Even for countries where testing capacity is high, the number of reported cases may underestimate the number of actual infections by order of magnitude, e.g. Perez-Saez et al. (2020) report a factor of over 10 for the Swiss Canton of Geneva. Given the high population densities in many African cities, combined with low testing capacities, it can be expected that the number of unreported infections is substantial. While fatalities linked to COVID-19 may also be underreported, it is likely that any underreporting bias there is less severe than for infections.

Income inequality is high, with a Gini coefficient of 42.4. On a scale of 100, the mean value of gender inequality is 54 (range 30 to 70). The table also indicates that access to quality education is unequally distributed (range 0.18 to 3.4). Access to political power has an average score of 2.2 (range of 0.26 to 3.4). The mean corruption score for the countries is about 35.043 out of 100, suggesting that corruption is relatively high.

On average, people are expected to live up to 62 years in our sample—the proportion of people who are 60 years and above averages about 4 per cent.

Table 1: Descriptive statistics

	Mean	SD	Min	Max
COVID-19 Infections per 100000 people	130.340	207.063	0.878	1067.409
COVID-19 Deaths per 100000 people	2.215	3.866	0.000	23.956
Average Gini coefficient	42.411	7.953	27.620	66.605
Gender inequality index	54.176	8.426	30.000	70.100
Equal access to quality education	1.660	0.901	0.176	3.451
Equal access to political power	2.191	0.802	0.256	3.404
Population 60 years and above	3.748	1.940	1.963	11.999
Life expectancy at birth	62.197	6.474	49.670	75.855
Log GNI per capita	8.139	0.864	6.712	10.077
Freedom of corruption	35.043	11.675	16.000	66.000

III. Empirical Results

Bivariate relationships

Table 2 presents correlations between our main dependent variables and our measures of inequalities and exclusion.

Table 2: Correlation between COVID-19 and different types of inequality

	COVID-19 Infections	COVID-19 Deaths
Average gini coefficient	0.373*	0.363*
Gender inequality index	-0.336*	-0.279
Equal access to quality education	-0.010	-0.157
Equal access to political power	0.030	-0.016
Log GNI per capita	0.456**	0.377**
Population 60 years and above	0.186	0.183
Life expectancy at birth	0.175	0.111
Freedom of corruption	0.304*	0.188
Observations	46	46

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figures 1-4 plot the relationship between reported COVID-19 infections and measures of economic and social inequalities in sub-Saharan Africa. In general, the associations between the different variables are relatively weak and outliers matter.

Figure 1 shows a positive relationship between COVID infections and the Gini coefficient, which is partly driven by outliers. Figure 2 graphs the relationship between COVID-19 infections and gender inequality. The graph tends to suggest that higher equality between men and women is associated with lower infection rates. From Figure 3, the incidence of reported COVID-19 infections is mostly unaffected when citizens have equal access to quality education. The small negative association might indicate that some educated people may be better able to undertake measures to protect themselves. We observe from Figure 4 that there is no relevant correlation between COVID-19 infections and equal access to political power by all social groups. The positive bivariate association between infections and economic inequality measured by the Gini index as well as the negative bivariate association between infections and gender inequality are statistically significant. In contrast, access to quality education and access to political power as measures for exclusion do not show significant associations with the number of reported infections.

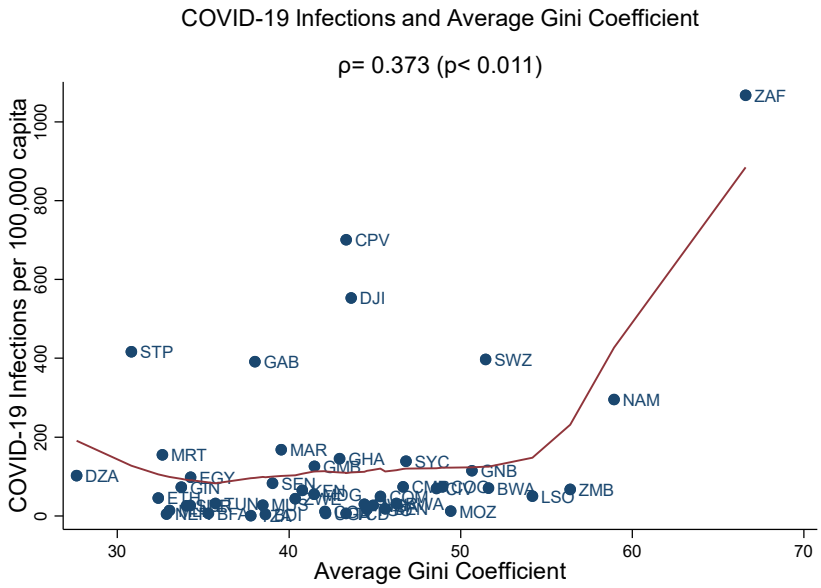

Figure 1 COVID-19 Infection and Income Inequality

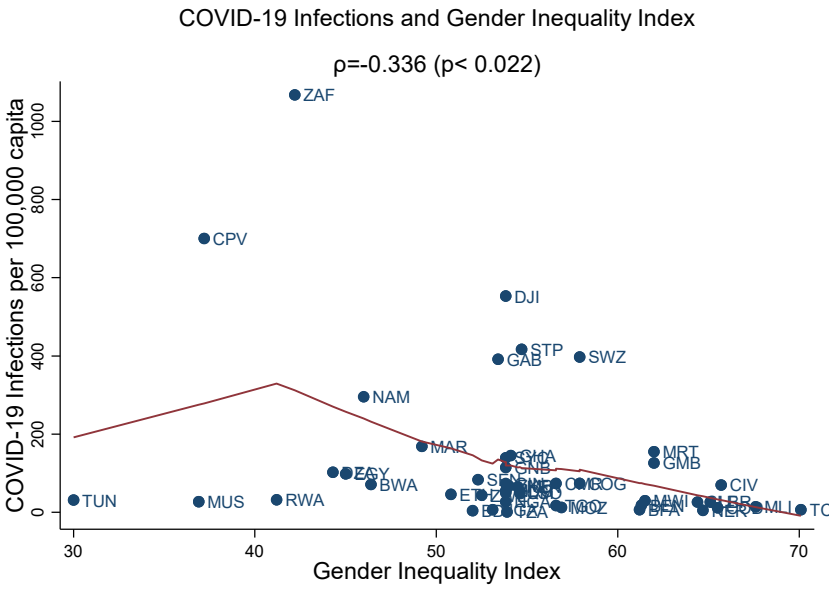

Figure 2: COVID-19 Infections and Gender Inequality Index

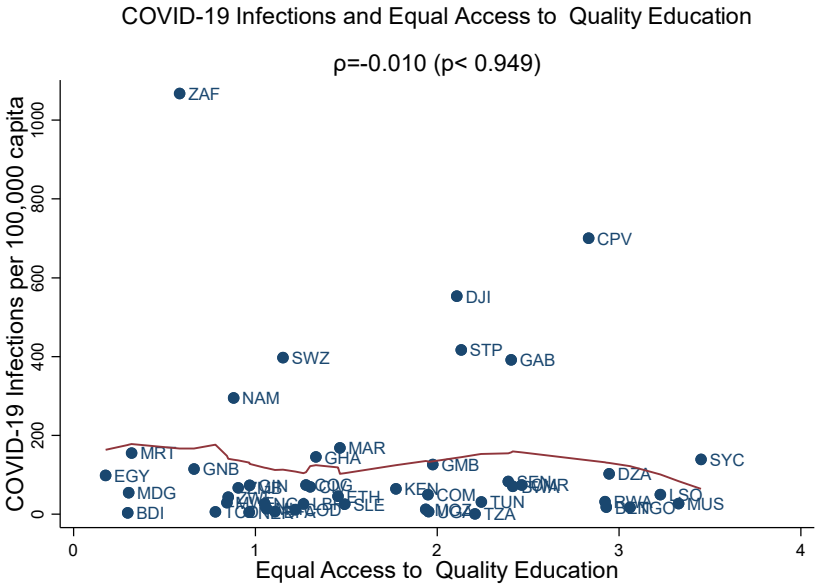

Figure 3: Covid-19 Infections and Equal Access to Quality Education

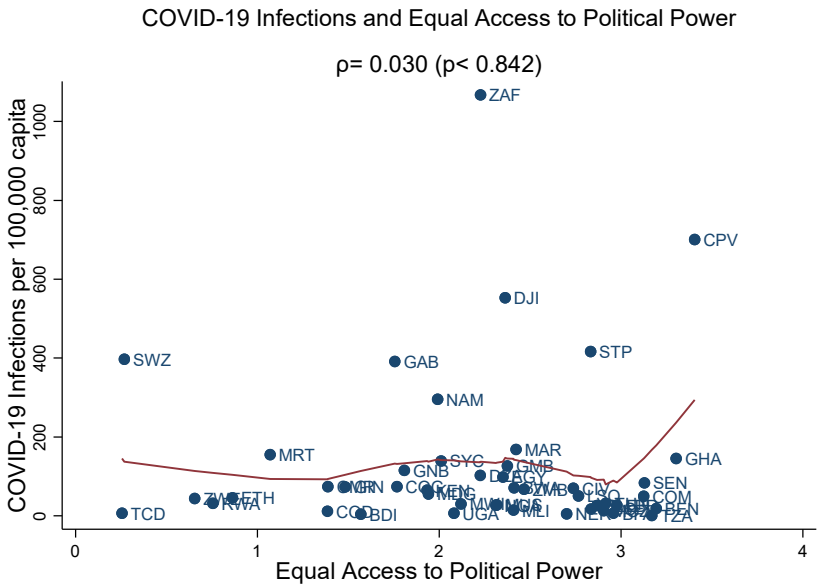

Figure 4: Covid-19 Infections and Equal Access to Political Power

Figure 5-8 examines the relationships between COVID-19 deaths and the four measures of inequality and exclusion. We observe similar relationships as pertained in Figures 1-4. In particular, we find that reported COVID-19 deaths are somewhat higher when income inequality is also high, suggesting a potential relationship between income inequality and fatalities. The correlation between the two variables is about 0.363 ($p<0.013$). All other measures for inequalities show negative associations with the number of COVID-19 related fatalities per hundred thousand people. Indeed, regarding the relationship between COVID-19 deaths and equal access to quality education, Figure 7 shows that the two variables are negatively correlated. However, the correlations coefficient of -0.19 is weak and not statistically significant. Similarly, Figure 8 shows a negative relationship between reported deaths and access to political power.

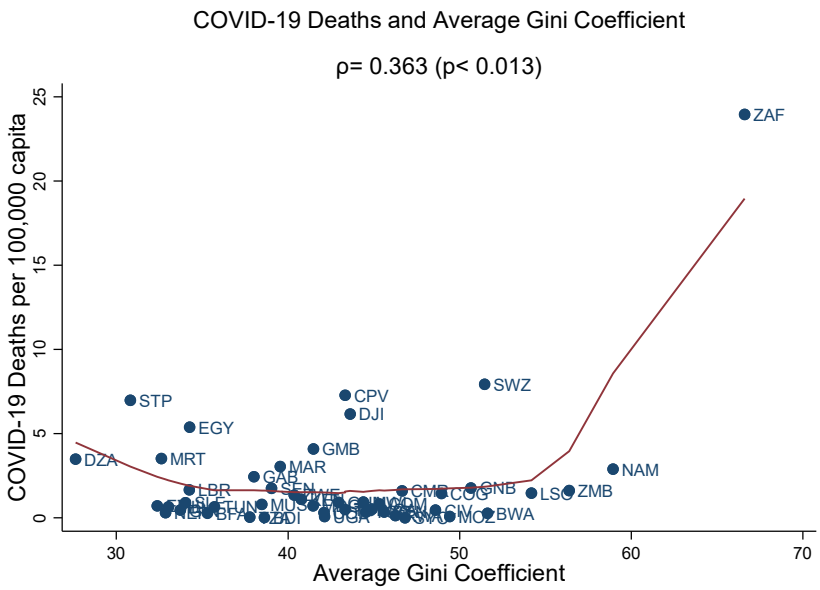

Figure 5: Covid-19 Deaths and Income Inequality

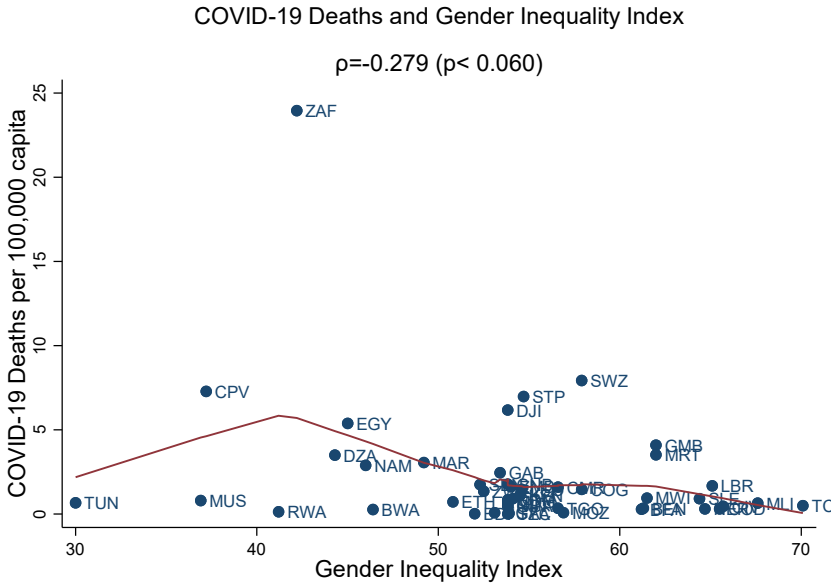

Figure 6: Covid-19 Deaths and Gender Inequality Index

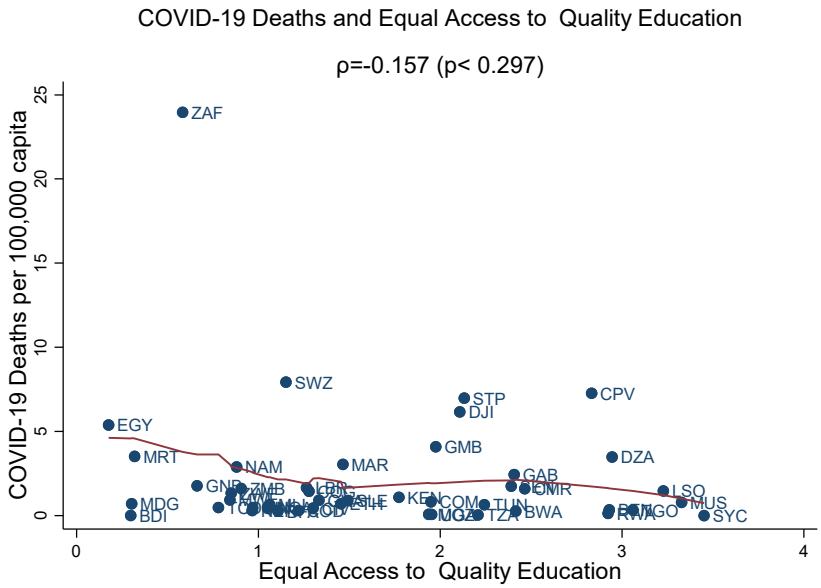

Figure 7: Covid-19 Deaths and Equal Access to Quality Educations

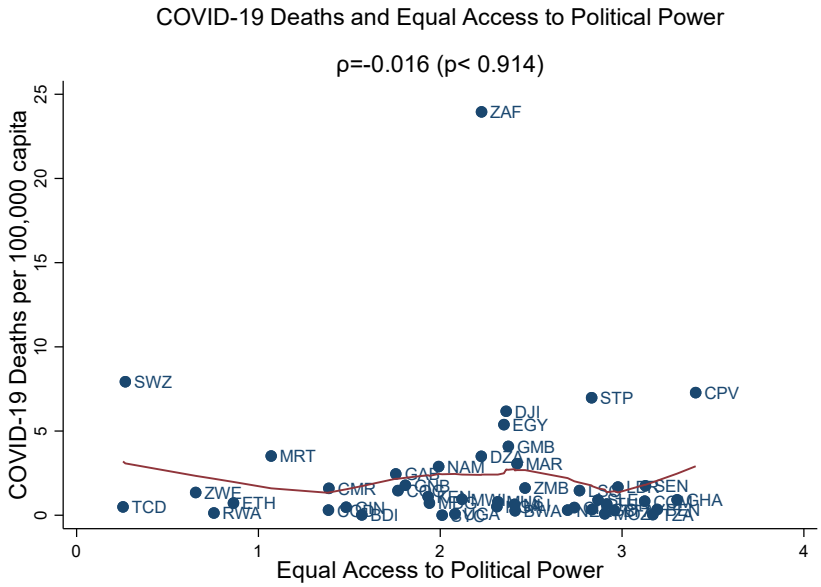

Figure 8: Covid-19 Deaths and Equal Access to Political Power

Multiple regression results

The results so far suggest only a potential bivariate relationship between some of the four measures of inequality on the one hand and total COVID-19 deaths and infections on the other hand. However, different types of inequality may affect each other. Moreover, other factors apart from inequalities may matter too for infections and fatalities, e.g. economic development may be associated to equality or inclusion and may, at the same time, affect the health situation in a country, i.e. multiple interactions and relationships may matter. The bivariate relationships do not allow to account for the multiplicity of the different relationships. However, including other factors and accounting for relations between the variables through multiple regression analysis helps to address and partly overcome such issues.

Table 3: Multiple regression analysis: The relationship between Inequalities, COVID-19 Infections and Fatalities in Africa

	(1) COVID-19 Infections	(2) COVID-19 Infections	(3) COVID-19 Deaths	(4) COVID-19 Deaths
Average Gini Coefficient	8.732	7.517	0.159	0.148
	(5.786)	(6.137)	(0.139)	(0.143)
Gender Inequality Index	-8.199*	-3.478	-0.149*	-0.054
	(4.293)	(4.655)	(0.082)	(0.082)
Equal Access to Quality Education	-31.457	-43.689	-1.206	-1.491
	(38.131)	(42.844)	(0.851)	(0.969)
Equal Access to Political Power	15.120	13.004	0.280	0.303
	(33.315)	(27.557)	(0.575)	(0.518)
Population 60 Years and Above		-25.758		-0.056
		(22.978)		(0.403)
Life expectancy at birth		3.448		0.035
		(5.084)		(0.103)
Log GNI per capita		108.085**		1.501**
		(42.215)		(0.603)
Freedom of corruption		1.154		0.008
		(3.232)		(0.054)
Constant	223.260	-994.053	4.915	-13.802
	(236.558)	(594.244)	(3.935)	(11.586)
N	46	46	46	46
R^2	0.240	0.358	0.253	0.329

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Thus, we estimate equation (1) and (2) in Table 3, where we include an array of different relevant control variables to gauge the multiple relationships and account for the complex nature and relevant differences between countries.

For each dependent variable (infections and deaths), we present two columns of results. In the first case, (columns (1) and (3)), the respective dependent variable is explained by the four measures of inequality and exclusion. Columns (2) and (4) then also take account of other factors such as gross national income, life expectancy at 60 years, the proportion of the population who are 60 years and above and the level of corruption in the country.

The results show that most inequalities do not have to power to explain infection and fatality rates to a large degree. We find that the Gini coefficient has a positive but statistically insignificant association with COVID-19 infections and deaths, i.e. accounting for multiple inequalities, economic inequality alone matters less. Both columns (1) and (3) show a negative and statistically significant effect of gender inequality on infections and deaths, however, the variable is no longer significant when we control for other covariates and economic variables, i.e. when systematically accounting for multiple variables gender inequality turns out to have no relationship with COVID-19. There is not a relevant association between equal access to political power and infections or deaths once accounting for different other types of inequality or more covariates.

Regarding other variables, countries with higher per capita income reported higher infections and mortality rates. We think this is because comparatively richer countries in the region may have invested in more testing facilities, i.e. they report more cases and may also have the possibility to better account for reasons of deaths. Moreover, such countries could be more open to the international community through trade and returning migrants, which potentially exposes them more to the virus.

IV. The Case of Ghana

Our study systematically investigates the roles of inequalities and exclusion in the COVID-19 pandemic for countries across Sub-Saharan Africa. The employed method accounts for diverse relations between the measures of inequality and takes account of the multitude of potential relationships. While our approach so far allows us to disentangle the complexity of the pandemic to some degree and highlight the relevance of some inequalities, a macro analysis of this type gains substantially when supported by micro-level case reports. Thus, we explore anecdotal and empirical evidence from Ghana. While Ghana does not reflect all experiences in the context of Sub-Saharan Africa in a representative way, its case highlights the relevance for countries in the region to address the diverse challenges of socioeconomic inequality and exclusion.

The first two cases of COVID-19 were recorded in Ghana on March 12, 2020. Since then, the case count has increased to almost 50000 by the middle of November 2020. Out of this case count which may be associated with issues of underreporting as in virtually all countries around the world, substantially less than one percent have died, the rest have recovered from the virus. Recent data are reported transparently on https://www.ghanahealthservice.org/covid19/. The high recovery rate and management of the pandemic have received praise from various quarters (Zhang, Nonvignon, & Mao, 2020) and are consistent with the view expressed by Frempong et al. (2020) of a youthful

population that suffers less from the lethal effects of COVID-19. While this is impressive, it is also essential to identify socioeconomic dimensions and highlight lessons that could be leveraged against future pandemics and for inclusive development in general.

In terms of the pandemic burden, Ghana comes only second behind Nigeria in the West and Central sub-regions of Sub-Saharan Africa (UNICEF, 2020). Within Ghana, however, available statistics suggest that the burden of the pandemic is disproportionate across administrative regions. Table 4 shows the five most affected administrative regions in Ghana, along with the Gini coefficient (identified as the most relevant type of inequality in the above analysis) and poverty headcount in these regions. The table shows that the Greater Accra region has been the most affected region with a total case count of about 24,616 as of October 21, 2020. The region has a Gini coefficient of about 35.1% and poverty headcount of 2.5%. A striking observation from these statistics is the fact that while poverty levels are much lower in the region, inequality levels are high and similar to what persists in the other regions. The statistics on economic inequality across these regions do not necessarily suggest a systematic relationship with COVID-19 case count in the regions which would broadly correspond to what has been suggested by the macro-level evidence. Indeed, some of the regions that recorded the least number of cases also have high economic inequality statistics (GSS, 2018). However, a quantitative analysis of the case with multiple regression tools would have to consider the relatively higher population density and the presence of slums and over-crowded settlements in these five regions. A large number of people live in deplorable economic conditions in these regions, making them vulnerable to viral pandemics of this nature.

Table 4: COVID-19, Inequality and Poverty in Ghana

Administrative regions	COVID-19 infections	Inequality	Poverty headcount
Greater Accra	24,616	35.1	2.5
Ashanti	10,997	37.9	11.6
Western	2974	36	21.1
Eastern	2420	35.4	12.6
Central	1928	37.4	13.8
Ghana	47461	43	23.4

Source: Ghana Health Service (https://www.ghanahealthservice.org/covid19/) & Ghana Statistical Service (2018)
Note: COVID-19 case count reported on October 21, 2020. Inequality measured by the Gini coefficient.

For instance, available data suggest that, throughout the country, overcrowding within households is most prevalent in these five regions. Most households in these regions live in single room structures, suggesting overcrowding. In some parts of the regions, more than 60 per cent of households have only one room for the entire household. Moreover, these regions also recorded the highest number of households without soap or water for handwashing (GSS, 2020). For instance, in the Korle Klottey Municipal in the Greater Accra region, there are about 4,956 households without soap for handwashing. Other districts in the same region with similar conditions include Ledzokuku Municipal (1,811 households) and LA Dade-Kotopon Municipal (4,261 households). In the Ashanti region, KMA-Subin Municipal had about 2,875 households

without soap for handwashing (GSS, 2020). It is important to note that, aside from these districts, there are no other districts or municipalities throughout the country with more households without soap for handwashing.

While the discussion so far points to the fact that, inequality and poor living conditions may have explained the rate of infection across the country, these conditions also hampered response strategies of the government. After the first two cases were recorded, the government of Ghana imposed lockdowns across affected regions. However, the prevailing inequalities and poor economic conditions threatened the success of the lockdown. Indeed, asking individuals who live on their daily earnings to stay home would always face resistance. The effectiveness of lockdowns has also been questioned from a broad health perspective (Giesecke, 2020). For low- to medium-income countries which have adopted vast lockdowns, negative secondary consequences were felt early and the WHO has warned of a breakdown in the supply of essential health services with severe human costs due to other diseases. Lockdowns in the developed world are estimated to have caused a global economic downturn with worse adverse economic effects to be expected for more fragile economies in Sub-Saharan Africa (IMF, 2020).

To ameliorate this problem, the government of Ghana launched a program that aimed at feeding the poor and vulnerable in the bid to keep them at home. However, the cost of providing these meals and the difficulties in identifying the most vulnerable and needy made the program unsustainable. The government therefore partially lifted lockdown restrictions at a time some health experts considered it to be too early. However, it shows that the government realised relevant trade-offs associated with the pandemic.

Another challenge posed by the high levels of socioeconomic inequality was how to implement effective contact tracing in slums and crowded settlements. The crowded nature of the settlements meant that a single positive COVID-19 case in these areas required that an entire community must be traced and tested. This was also complicated by unfavourable education inequality. It is more difficult to inform residents in these areas about the pandemic and how to stop its spread.

In general, the case of Ghana tends to corroborate the quantitative analysis presented above. While pandemics can increase inequalities and exclusion, past inequality, precisely socioeconomic inequality while accounting for other types of exclusion, may have increased the burden of the pandemic to some limited extent. Thus, conscious efforts to reduce inequalities and exclusion within and across countries may gain further importance. In Ghana, specifically, an important lesson from the COVID-19 pandemic and corresponding response strategies is the need to improve economic conditions, especially across slums and crowded settlements. This is also relevant for future pandemic responses. Recent efforts to establish government ministries responsible for the transformation of slums and crowded settlements is commendable. However, ensuring these ministries are sufficiently resourced to achieve the relevant objectives will be important. Other countries could also leverage these lessons and prepare for future pandemics by improving socioeconomic wellbeing.

V. CONCLUSION

Inequalities and exclusion are multiple in their nature and could adversely affect the fight against COVID-19 by eroding confidence and trust in public institutions. During pandemics, trust in public institutions, especially health-related institutions, count as important social capital to curb the spread. Inequalities have a multidimensional effect on public health outcomes. First, they might affect the effectiveness and quality of health care delivery in a country, the implementation of public health measures, public compliance and the ability of governments to mobilise the sense of community and nationalism among its citizenry to combat the disease. In Sub-Saharan Africa, the relationship between COVID-19 and inequalities is relevant as particularly the unequal distribution of income created a large share of the populace without access to essential services and health facilities.

We explored the relationship between multiple types of inequalities and COVID-19 infections and deaths. Our results show that income inequality may have some predictive power for both infections and deaths from COVID-19. However, the statistical significance vanishes once other inequalities and socioeconomic characteristics are accounted for. Although we find that other forms of inequality and exclusion may worsen the situation in the sub-region, the relationships are mostly statistically insignificant and quantitatively small. Our method takes account of the possibility that different types of inequalities are related to each other and maybe affect each other. Thus, our approach takes account of relevant aspects of relationality and multiplicity. Our results mean that efforts to curb future infectious diseases should also include measures to reduce socioeconomic inequality in particular alongside other types of exclusion. It is important to note that a sustained reduction in income inequality is a long-term process.

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