



Assessing the Costs and Benefits of COVID-19 Containment Strategies in Africa

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**Assessing the Costs and Benefits of COVID-19
Containment Strategies in Africa**

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Abstract

This paper explores the extent of variation in African countries' responses to the COVID-19 pandemic, assessing the relative success of different strategies in containing the spread of disease as well as the costs containment strategies have entailed. I begin by examining the range of responses taken by different African governments, looking at the consequences for population mobility and spread of infection during the first seven months of the pandemic (March-September 2020). Using anonymized mobile phone data, I show that mobility reductions were significantly greater in countries where the government enacted more stringent measures. Statistical regression analysis indicates that such mobility reductions are significantly and negatively associated with COVID-19 growth rates two weeks later. However, the success of lockdown policies in containing the spread of disease came at a significant cost in many countries, including severe economic contraction, disruptions to essential services, and curtailing of human rights. That said, such costs do not appear to be a necessary result of enacting stringent measures. Cross-country analysis reveals a number of cases where governments acted swiftly and seriously to contain the spread of disease but did not suffer major economic or governance consequences. Highlighting the experiences of such countries is important for drawing lessons about best practices for continued management of COVID-19 and future outbreaks.

1 Introduction

When COVID-19 began its global spread, it appeared at first that Africa might be spared (Otu et al., 2020). While such initial optimism did not come to pass, the virus has taken less of a toll on the continent than in many other world regions (Rwema et al., 2020). As such, the narrative in the international media (and some scholarly accounts) has shifted to the question of why the death toll hasn't been higher (Nordling, 2020; Nyabola, 2020). But accounts that frame Africa's low death rates from COVID-19 as a "mystery" ignore years of investment and experience working to contain other deadly infectious diseases. Over the past decade, 41 African countries have gone through at least one epidemic, including Ebola in West Africa and the Democratic Republic of Congo and recurrent Lassa fever outbreaks in Nigeria. Such experiences have driven major improvements in surveillance, preparedness, and clinical and laboratory capacity (Otu et al., 2020). As such, many African states were poised to act quickly and seriously after the first cases of COVID-19 appeared in the region. That said, the responses of African governments have been far from uniform, reflecting variation in state capacity and political will. This paper explores the extent of such variation, assessing the relative success of different strategies in containing the spread of disease as well as the costs containment strategies have entailed.

I begin by examining the range of responses taken by different African governments, looking at the consequences for population mobility and spread of infection during the first seven months of the pandemic (March-September 2020). Using anonymized mobile phone data, I show that mobility reductions were significantly greater in countries where the government enacted more stringent measures. Statistical regression analysis indicates that such mobility reductions are significantly and negatively associated with COVID-19 growth rates two weeks later. However, the success of lockdown policies in containing the spread of disease came at a significant cost in many countries, including severe economic contraction, disruptions to essential services, and curtailing of human rights. That said, such costs do not appear to be a necessary result of enacting stringent measures. Cross-country analysis reveals a number of cases where governments acted swiftly and seriously to contain the spread of disease but did not suffer major economic or governance consequences. Highlighting the experiences of such countries is important for drawing lessons about best practices for continued management of COVID-19 and future outbreaks.

2 Lockdown and COVID-19 Containment

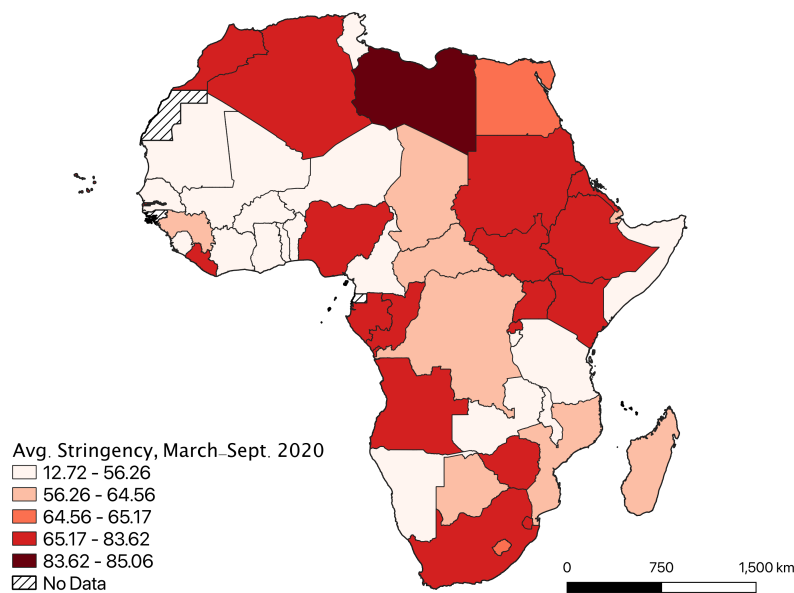
The first case of COVID-19 on the African continent was confirmed on February 14, 2020 in Egypt. As of May 13th, cases had been confirmed in all 54 countries and by early October, the confirmed caseload was over 1.5 million.¹ The burden of disease has not been evenly spread, however. Nearly three-quarters of all COVID-19 cases on the continent are from just six countries (South Africa, Morocco, Egypt, Ethiopia,

¹Data on confirmed cases from Hasell, Mathieu and Beltekian (2020)

Nigeria, and Algeria).² Government responses have varied considerably as well. Countries in North Africa were some of the earliest to act, with Tunisia implementing school closures on March 8th and Egypt closing workplaces and schools on March 16th. That same day also saw Tunisia, Libya, Sudan, Kenya, and Algeria close their borders.³ But in short order nearly all countries on the continent put in place strategies that mirrored those of other, higher income regions (Teachout and Zipfel, 2020). By the end of April, 48 out of the 50 African countries for which comparable data is available had closed some or all schools, 39 had required closing (or work from home) for at least some sectors or categories of workers, 38 had placed restrictions on public gatherings, and 41 had banned incoming travel from all regions or enacted a total border closure.⁴

The extent to which such measures were prolonged varied considerably, however. Figure 1 depicts the average stringency of government responses across all countries with available data during the first seven months of the pandemic (March-September 2020).

Figure 1: Stringency of Government Responses, March-September 2020



The degree to which government responses to COVID-19 affected people’s daily lives varied considerably as well. In order to investigate population responses, I analyze anonymized mobile phone data from Google’s COVID-19 Community Mobility Reports (Google, 2020). These reports are based on aggregated, anonymized data from users of Google Maps, and show how visits and length of stay at different

²Figures as of the end of September 2020.

³Data from Hale et al. (2020).

⁴Data from Hale et al. (2020).

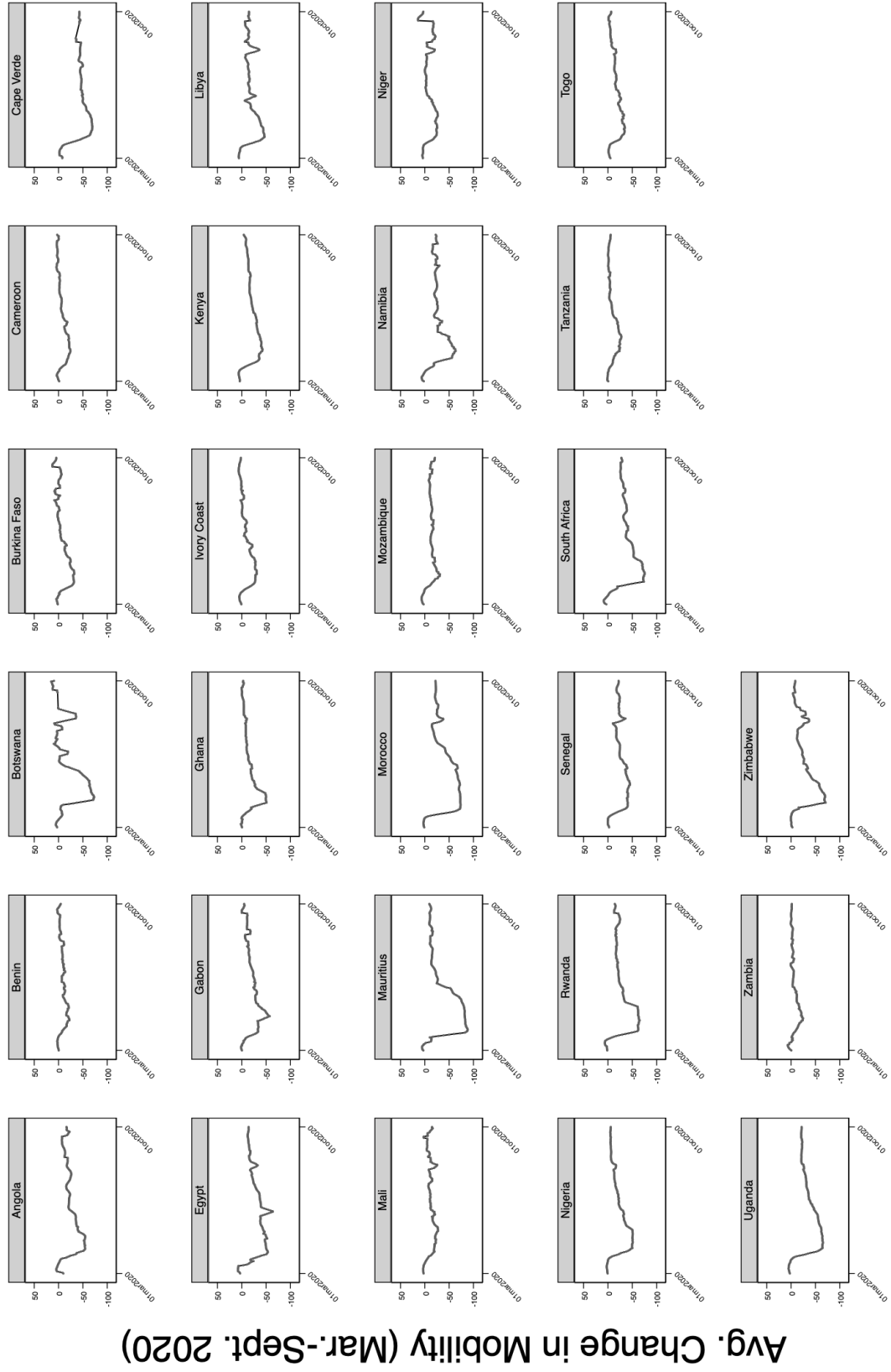
places change compared to a baseline. I examine three categories:

1. *Workplaces*: Mobility trends for places of work.
2. *Retail & recreation*: Mobility trends for places like restaurants, cafes, shopping centers, theme parks, museums, libraries, and movie theaters.
3. *Transit stations*: Mobility trends for places like public transport hubs such as subway, bus, and train stations.

Figure 2 depicts the average change in mobility across the three categories for all African countries with available data. We see that most countries experienced notable declines in population mobility, particularly during the first few months of the pandemic. However, the degree to which mobility decreased, and the extent to which such mobility reductions were sustained varies considerably across countries. For instance, both Mauritius and South Africa experienced very steep initial declines, but mobility resumed normal trends after a few months in Mauritius whereas reductions were prolonged in South Africa. On the other hand, countries like Tanzania and Zambia do not appear to have experienced much of a change to population mobility at all. To an extent, this may reflect variation in smartphone penetration across countries, as the Google Reports only capture the activities of smartphone users.⁵ However, as the subsequent analysis shows, the mobility trends captured through smartphone data correlate strongly with the stringency of government responses.

⁵For more information about these reports, see <https://www.google.com/covid19/mobility/> (accessed 30 October, 2020).

Figure 2: Average Changes in Population Mobility, March-September 2020



Avg. Change in Mobility (Mar.-Sept. 2020)

Date

Graphs by country

Table 1 depicts the results of regression analysis of the relationship between the stringency of government response and changes in population mobility. All models include country fixed effects and standard errors clustered by country. I also include a time trend to account for any other factors changing over time within each country. We see that those countries which implemented more stringent responses saw larger corresponding reductions in population mobility. We can also see that population mobility reductions tended to diminish over time – likely reflecting “lockdown fatigue.”

Table 1: Stringency of Government Responses and Mobility Reductions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Workplace	Retail/Rec.	Transit	Average	Workplace	Retail/Rec.	Transit	Average
StringencyIndex	0.48*** (0.06)	0.61*** (0.06)	0.68*** (0.04)	0.59*** (0.05)	0.49*** (0.06)	0.64*** (0.05)	0.70*** (0.04)	0.49*** (0.06)
Time trend					-0.01*** (0.00)	-0.04*** (0.00)	-0.03*** (0.00)	-0.01*** (0.00)
Observations	5715	5514	5395	5715	5715	5514	5395	5715
R^2	0.458	0.492	0.567	0.528	0.494	0.686	0.669	0.494

Standard errors in parentheses

The dependent variable is the weekly average of mobility reductions for workplaces (Models 1 and 5), retail and recreation (Models 2 and 6), transit stations (Models 3 and 7), and overall (Models 4 and 8).

All models include country fixed effects and robust standard errors clustered by country.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In order to determine how stringent government responses, and corresponding mobility reductions affected the spread of disease, I proceed to estimate a series of regression models with average weekly exponential growth in confirmed COVID-19 cases as the dependent variable. The independent variable in the first model is the stringency of government response; Models 2-5 consider the impact of average weekly mobility reductions for each of the three main categories discussed above (workplace, retail/recreation, and transit stations) for the preceding two weeks. As above, all models include country fixed effects and standard errors clustered by country and a time trend. The results, depicted in Table 2, suggest that strict lockdown policies (and corresponding mobility reductions) have indeed helped to play an important role in reducing the rate of new infections. This finding is in keeping with recent studies documenting the impact of government responses and mobility reductions on disease spread (Le et al., 2020; Askitas, Tatsiramos and Verheyden, 2020; Carlitz and Makhura, 2020). However, as I discuss in the next section, the benefits of lockdown have come at a cost for many countries.

Table 2: Stringency of Government Responses, Mobility Reductions and Infection Rates

	(1)	(2)	(3)	(4)	(5)
LI4.StringencyIndex	-0.12*** (0.01)				
LI4.Average weekly reduction in mobility (workplaces)		-0.15*** (0.02)			
LI4.Average weekly reduction in mobility (retail/recreation)			-0.16*** (0.02)		
LI4.Average weekly reduction in mobility (transit stations)				-0.15*** (0.02)	
LI4.Avg. Overall Weekly Mobility Reduction					-0.17*** (0.02)
Time trend	-0.02*** (0.00)	-0.02*** (0.00)	-0.03*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)
Observations	9812	5309	5108	4989	5309
R^2	0.433	0.428	0.471	0.468	0.469

Standard errors in parentheses

The dependent variable is the weekly average of the daily exponential growth rate of confirmed cases.

All models include country fixed effects and robust standard errors clustered by country.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3 Lockdown Downsides

Enacting stringent measures to contain the spread of COVID-19 entails a number of costs – not only to the countries enacting them but to all countries embedded in the global economy. This section begins by exploring economic costs, and the extent to which they are a function of the degree of stringency in government response. I then examine costs in terms of population health, looking at how lockdowns have interfered with essential health services and preventive care. Finally, I examine the governance consequences of lockdown – in particular the the potential for human rights abuses and erosion of democratic freedoms.

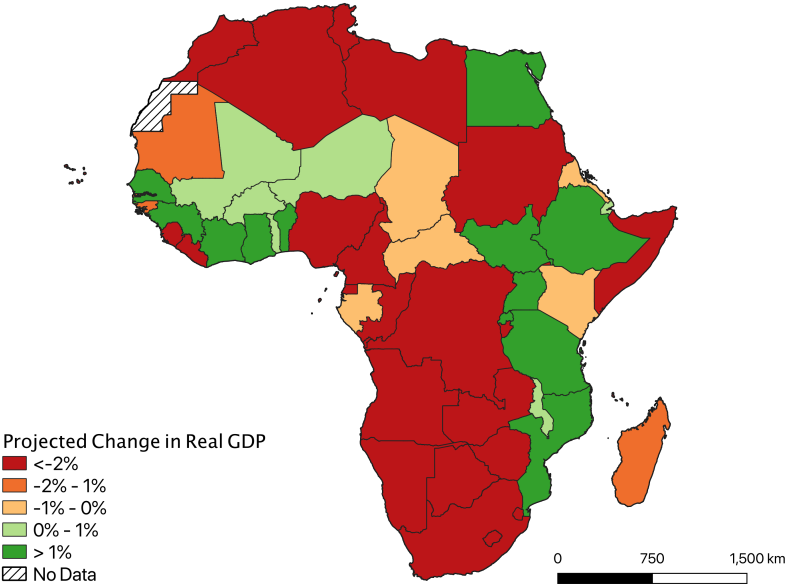
3.1 Economic Impact

Stringent lockdowns necessarily entail considerable economic consequences – at least in the short term – as all but “essential” workers are confined to their homes and opportunities to participate in income-generating activities are curtailed. Whereas many citizens in high-income economies are able to work from home if needed, the majority of people in many African countries are employed in sectors that do not make such arrangements conducive.⁶ Economic contraction has also featured even in countries that

⁶According to recent estimates from the International Labour Organization (2018), the vast majority of workers in Africa (85.8 percent) are employed in the informal sector. This includes agriculture, domestic work, and street vending, among other jobs that may be difficult to perform remotely.

did not enact stringent measures, given their reliance on trade and investment from abroad. Figure 3 depicts the International Monetary Fund’s real GDP growth projections for 2020 (International Monetary Fund, 2020). We see that the majority of countries on the continent are expected to experience economic contraction. In some instances this is quite severe. For instance, the Seychelles, Mauritius, and Zimbabwe are all expected to see real GDP decline by over 10 percent, and Libya’s economy is projected to contract by over 50 percent in 2020.

Figure 3: Projected Change in Real GDP, 2020 (IMF)



To what extent is economic contraction a necessary consequence of stringent lockdown measures? In order to answer this question, I estimate a series of regressions with 2020 economic growth projections as the dependent variable. The results (depicted in Table SM1 in the Appendix) indicate that economic contraction does not necessarily result from lockdown but rather correlates primarily with pre-pandemic economic development. Somewhat surprisingly, neither trade embeddedness (exports as a percent of GDP) nor regional integration⁷ exhibit any association with projected GDP trends. The number of confirmed COVID-19 cases and the number of confirmed deaths are also not correlated with projected changes in real GDP.

⁷Regional Integration is measured using the 2019 Africa Regional Integration Index (African Union Commission, United Nations Economic Commission for Africa and African Development Bank, 2019).

3.2 Impact on Population Health

Pandemic control diverted scarce resources from the health sector in many countries, with serious consequences for routine health monitoring and preventive care. A key informant survey of ministry of health officials in 105 countries conducted from May-July 2020 illustrates widespread disruptions of healthcare, including essential services for communicable and noncommunicable diseases, reproductive, maternal, newborn, child and adolescent healthcare, and treatment for mental health disorders (World Health Organization, 2020). Health ministers from low-income countries were significantly more likely to report disruptions than their counterparts in high-income states, and within Africa an average of about 60 percent of services were reported to have been at least partially disrupted. These disruptions reflect both supply and demand-side factors, with fewer patients making appointments for outpatient care, and lockdown policies and financial difficulties further limiting demand. On the supply side, staff redeployment to deal with COVID-19, closures of health facilities, and supply chain issues also disrupted service provision.

The disruptions reported by health ministers align with citizen reports as well. According to a recent survey of over 450,000 Facebook users carried out in all world regions, nearly 20 percent of all respondents in sub-Saharan Africa indicated that they were unable to seek medical care as a result of the pandemic while over 10 percent reported difficulty accessing medical or hygiene supplies. Such concerns were particularly pronounced in Madagascar, Angola, and Uganda.⁸ While all three of these countries enacted relatively strict COVID-19 control measures, there does not appear to be a systematic relationship between the stringency of government responses and the degree to which such concerns were raised.

3.3 Impact on Governance

Finally, close observers of politics and human rights have sounded the alarm in a number of countries where the government and state authorities are seen to be overstepping their mandates and infringing on civil liberties in the name of COVID-19 control. There have been reports across the continent of violence against citizens by state officials deployed to enforce stay-at-home orders and curfews (Amadasun, 2020). South African security forces have arrested people for failing to comply with self-isolation and quarantine mandates; police brutality in the name of lockdown enforcement has also been reported in Zimbabwe (Obasa et al., 2020). In Kenya, “forced quarantines” left people entering the country stranded in facilities without food, water, bedding, or cleaning supplies (Human Rights Watch, 2020).

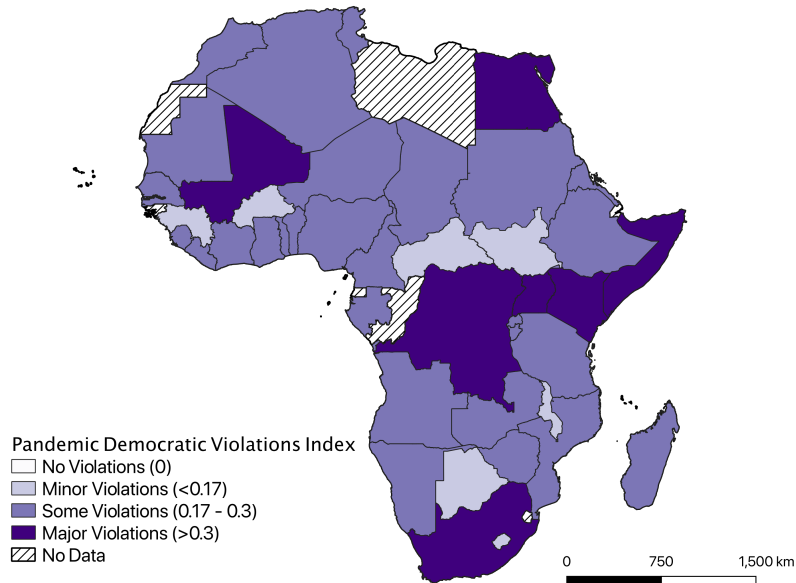
In order to assess such threats more systematically, I examine data from V-Dem’s Pandemic Backsliding project,⁹ which tracks violations of democratic standards for emergency measures during the pandemic. These include: discriminatory measures, derogation of non-derogable rights (e.g., the right to life

⁸For more on the survey, see Cookson et al. (2020). Regional and country aggregate data from (Facebook, 2020).

⁹<https://www.v-dem.net/en/our-work/research-projects/pandemic-backsliding/> (accessed 29 October 2020).

and freedom from torture), abusive enforcement, lack of time limit on emergency measures, disproportionate limitations on the role of the legislature, official disinformation campaigns, and restrictions on media freedoms (Maerz et al., 2020). Figure 4 depicts variation in overall Pandemic Democratic Violations across the continent during the first seven months of the pandemic (March-September 2020). We see that all countries where data is available have experienced at least some violations.

Figure 4: Pandemic Democratic Violations, March-September 2020



As above, we may wish to know the extent to which democratic violations are a function of the stringency of government responses. I estimate another series of regressions with the extent of backsliding as the dependent variable. The analysis (available upon request) shows that much like economic contraction, curtailing democratic rights and freedoms is not a necessary consequence of enacting stringent measures to contain the spread of disease. This finding is in keeping with Maerz et al.’s (2020) analysis of 138 countries, which finds no relationship between violations of democratic standards for emergency measures and COVID-19 death rates, suggesting that human rights abuses cannot be justified in the name of disease control.

4 Lessons and Looking Ahead

The preceding analysis is necessarily preliminary, given limits to data availability and comparability as well as the fact that the COVID-19 pandemic is still unfolding as of this writing (October 2020). But taking stock of the experiences of countries across the continent at this point in time is helpful to inform best

practices going forward – for COVID-19 as well as future outbreaks. The first key takeaway is that while African countries initially appeared to be mirroring the responses of higher-income regions, enacting measures such as school closures and stay-at-home orders, a closer look reveals considerable variation in the prolonged implementation of such measures and population compliance with them. The preceding analysis suggests that stringent containment measures play an important role in reducing the spread of disease, but also shows that they come at a cost. However, the cost is not uniformly experienced. Importantly, stringent containment measures do not appear to automatically induce economic contraction or necessitate human rights violations. Thus, it is worth looking more closely at countries that have managed to avoid such pitfalls.

For example, Malawi's economy is expected to grow by one percent in 2020, putting it in a better position than many other countries on the continent. Furthermore, following a court injunction to stop a planned national lockdown, given concerns about its adverse impact on poor Malawians, the President established an emergency cash transfer program for poor citizens and small businesses (Obasa et al., 2020). Although concerns about informed consent, discrimination, and stigmatization have been raised (Ibid), human rights violations also appear to have been kept to a minimum (the country scores 0.1 on V-Dem's Pandemic Democratic Violations Index between March-September). The country has also enacted measures to combat violence against women as a result of the pandemic. For example, the government has been using radio stations, television, newspapers, and public address systems to raise awareness about violence against women in the face of COVID-19. In addition, a Victim Support Unit and Hotline has been collecting and analyzing data, reporting types of cases that have either increased or decreased. A number of other African countries have taken similar measures to combat violence against women during the pandemic, including Angola, Cote d'Ivoire, Egypt, Nigeria, Uganda, and others (United Nations Development Program, 2020).

There are also likely lessons to be drawn from the experience of Botswana. The country mounted a quite stringent initial response, including a 28-day total lockdown, closing schools and businesses and canceling social activities. However, this did not result in serious democratic violations (Botswana scores a 0.05 on V-Dem's Pandemic Democratic Violations Index between March-September). As an example of the inclusive nature of policymaking in the country, a mandatory quarantine of all people arriving in Botswana or those with suspected exposure resulted in the entire parliament being subjected to a 14-day supervised quarantine (Obasa et al., 2020).

Further study is merited of these and other cases in order to identify best practices for COVID-19 containment. There are also likely lessons to be learned regarding infectious disease management more broadly speaking. While Afro-pessimism characterizes much of the reporting (and some of the scholarship) on Africa's experience with COVID-19 to date, these examples suggest that wisdom and experience gained from prior epidemics has put many countries in good standing – particularly compared to the Global North. As additional data becomes available, future research should delve more deeply into the

continent's COVID-19 success stories, in order to provide lessons not only for African countries but around the world.

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