High-speed Mobile Networks and Police Repression during the COVID-19 Pandemic: The Case of Nigeria

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Abstract

Purpose: Government repression against civilians while enforcing restrictive policies related to COVID-19 was widely reported in Africa. At the same time, many have claimed that high-speed mobile data and social media provide an accountability mechanism that may constrain police abuses. This study focused on Nigeria to examine (1) the effect of COVID-19 lockdowns on police repression and (2) whether widespread high-speed mobile data networks constrain or facilitate police repression.

Design/Methodology: Using data from the Armed Conflict Location and Event Database (ACLED) and the Mobile Coverage Database, and focusing on regional sub-units in Nigeria, this study used Difference-in-Differences (DID) and triple difference (DDD) estimation on a sample of 423,925 observations (local government area-days) between January 1, 2019 and June 30, 2020 to estimate the causal effects of COVID-19 lockdowns and high-speed mobile data on police repression.

Findings: Difference-in-Differences (DID) analyses reveal no increases in police repression during lockdown periods. However, triple difference (DDD) estimation finds that certain forms of police repression were greater during lockdown periods in areas with substantial high-speed (4G) mobile networks (a proxy indicator of rapid information dissemination and video sharing). Net 4G effects, separate from the lockdowns, were also observed. Police repression increased in areas with a widespread 4G network, even without lockdowns.

Research Implications: Contrary to theoretical hypotheses derived from self-awareness theory, as well as anecdotal claims of a "viral video effect" or "Ferguson Effect" constraining police behavior, proliferation of high-speed mobile networks in Nigeria appears to facilitate, rather than constrain, police repression. Additional studies may explore through what causal mechanisms high-speed mobile network proliferation affects police repression. For instance, it is possible that high-speed mobile data and social media allow police to detect and repress citizen behaviors they disapprove of, rather than permitting citizens to correct police behaviors they disapprove of.

Originality/Value: Although many studies have explored the COVID-19 pandemic and police behavior in Western countries, only a few have examined its effects in states with even more troubled policing institutions, including those in sub-Saharan Africa. The findings of increased government repression during lockdowns in areas with 4G proliferation, as well as the independent effects of 4G facilitating police repression even without lockdowns, present significant counterevidence to observations from the U.S. and elsewhere, which has suggested that the ability to rapidly and widely share videos of police misconduct via mobile devices can limit police repression. Such effects were not found in Nigeria.

Keywords: COVID-19, Lockdown, Government Repression, Police Brutality, Mobile Network, Africa, Nigeria, Triple Differences Estimation

Introduction

Several historic events in the year 2020 had clear consequences for police and society. First, the COVID-19 pandemic spread across the globe. The virus officially killed more than 1.8 million people, although the World Health Organization estimates at least 3.3 million people died of the virus based on excess mortality rates (W.H.O, n.d.). As of November 2022, at least 12,099,213 cases and 256,054 deaths were reported in Africa due to COVID-19.[1] Compounding the tragedy, the pandemic led to unintended consequences, including human rights abuses by governments during the implementation of movement restrictions. During the early phase of the pandemic, casualties in Africa from police brutality exceeded deaths directly related to COVID-19 infections, as governments enacted and enforced various restriction measures (BBC, 2020a). Reports of government agents enforcing nighttime curfews and lockdown measures—firing live ammunition and using other violent tactics against civilians—consistently appeared via news and social media. In Nigeria in particular, where police brutality and repression has long existed (Agbiboa, 2015a 2015b; 2020; Akinlabi, 2017), numerous cases of repressive enforcement of restrictive policies by police forces were reported. One particularly infamous case was the killing of a 16-year-old girl, Tina Ezekwe, by a police officer at a bus stop in Lagos while a nighttime curfew was in place (Okunola, 2020, June 4). Instigated by the worldwide spread of protests against police brutality following the killing of George Floyd by police in the United States, Nigerian citizens also actively protested police brutality and extrajudicial killings via social media. In short, several unique historical circumstances converged in 2020. First, the COVID-19

[1] According to CDC-Africa, there have been 12,099,213 COVID-19 cases reported as of November 4, 2022. The data is retrieved from https://africacdc.org/covid-19/.

pandemic contributed to lockdowns—as well as efforts to enforce them. Second, protests and social media activism targeted both police repression and lockdown restrictions. Third, these circumstances contributed to notable and occasionally violent police–public conflicts, which may have been particularly acute in nations with long histories of police abuses.

Research on state violence against civilians suggests that citizen dissent increases repression and police brutality (Carey, 2006, 2010; DeMeritt, 2016), though it is also contingent upon government type and level of democratization, which constrain state actors (Davenport and Armstrong, 2004). Because pandemic lockdowns led to protest and dissent, there is reason to believe that police–citizen conflict, including the use of force, would increase during lockdown periods—especially in borderline-anocracies such as Nigeria. This study tests that hypothesis.

This study also examines whether police–citizen conflicts during COVID-19 lockdowns are a function of high-speed mobile networks—the 4G mobile data infrastructure that facilitates the rapid dissemination of video. High-speed mobile networks have the potential to serve as an accountability system. Vis-à-vis self-awareness theory, high-speed mobile networks turn public service into public performance; behavior is more likely to reflect social expectations in the presence of an audience (Froming et al., 1981). Because police brutality and use of repressive measures are closely connected to corruption and a lack of accountability mechanisms (Agbiboa 2015a; 2015b), the proliferation of high-speed mobile networks may constrain agents of the state in using force against civilians. This was illustrated in the U.S. after several high-profile cases involving Black men killed by the police were only resolved due to citizen cell phone video widely shared on social media—and following such incidents, prominent police leaders argued that a "viral video effect" was contributing to less aggressive policing (Lichtblau, 2016, para. 2).

This study focuses on Nigeria for several reasons. First, Nigerian police are known for brutality, corruption, and unlawful use of force: the World Internal Security and Police Index ranks Nigeria's Police Force as the worst in the world (International Police Science Association 2016). In addition, Nigeria ranks second among sub-Saharan African countries for violent conflict events related to COVID-19.[2] Moreover, Nigeria imposed lockdown restrictions on some selected states but not on others, enabling between-state estimation of lockdown effects. Furthermore, a sizable percentage of the Nigerian population has access to online and social media platforms: 42% of the population uses the internet and more than 4 in 5 Nigerians have a mobile data connection. However, mobile network speed and availability varies significantly across sub-national units, which permits a test of the conditional effect of 4G mobile networks on the relationship between lockdown measures and police repression.

By utilizing the state-level variation in lockdown policies, as well as within-state variation of 4G mobile network proliferation, this study uses two causal inference techniques: Difference-in-Differences (DID) and Difference-in-Difference-in-Differences (DDD—also known as Triple Difference estimation). The results indicate that lockdowns did not predict a change in the number of police–citizen conflicts in Nigeria. They also reveal that high-speed mobile network proliferation seems to have *facilitated*, rather than constrained, police repression in the states where the lockdown was implemented. In addition, multiple measures

[2] This is based on the ACLED data retrieved from the ACLED website: https://acleddata.com/download/20967/.

of the government's repression of civilians worsened in areas of high-speed mobile network proliferation during lockdown periods—even in states that were not under lockdown.

This study makes two main contributions. First, it is one of few studies systematically examining how COVID-19 affected police institutions outside of the U.S. In a nation with a long history of police abuses, the pandemic provided even more opportunities for abuse. Second, this study contributes to the literature on police repression and mobile tech. Its focus on the proliferation of 4G technology explores how such high-speed mobile networks facilitate information-sharing and its effects on police violence. Recording and rapidly sharing evidence of wrongdoing through videos and pictures via 4G technology is not supported by lower generation technologies. 4G therefore provides theoretical opportunities for civilian oversight and police accountability.

Literature Review

The following sections review what is known about police repression in the context of COVID-19, the role of social media in policing the police, and the high-speed mobile infrastructure that modern video-centric social media often relies upon.

COVID-19 and State Repression of Civilians

In a variety of places and historical periods, citizen dissent often increases state repression (Carey 2006; 2010; deMeritt, 2016). Political leaders seek their own political survival and fear losing their power (Escribà-Folch 2013). Political leaders may resort to violence to quash threats to their political survival. Protests against COVID-19 lockdowns and contemporaneous protests against police repression may have therefore contributed to a perfect storm of dissent that could contribute to formal social control via state institutions.

In Nigeria, deaths from the use of police violence while enforcing various COVID-19 policies outnumbered deaths from COVID-19 infections shortly after its first lockdowns

began (BBC News, 2020). During this initial two-week period, 18 deaths were reported in 8 separate incidents of extrajudicial killings. The National Human Rights Commission (NHRC) received over "100 complaints across 24 of Nigeria's 36 states" including but not limited to the three states that were under the two-week lockdown (BBC News, 2020a).

According to the Armed Conflict Location & Event Data Project (ACLED) COVID-19 disorder tracker (Raleigh et al. 2010),[3] there were 86 social disorders related to COVID-19, and 30 people died in 16 separate incidents (ACLED, 2019). Among these 86 incidents, 41 (48%) involved the Nigerian Police Force using force. For COVID-19-related disorders during this period, fatalities ranged from 0 to 8 per incident. Fatalities were more common in incidents involving police than in incidents not involving police. Of cases involving police, they beat civilians in 17% of cases and used firearms in 24% of cases.

According to victim-focused research, Nigerian police employed illegitimate practices including brutality, bribery, extortion, and even sexual assault while policing the pandemic (Aborisade, 2021). In some cases, Nigerian police even targeted healthcare workers for aggression and extortion (Aborisade & Gbahabo, 2021). These abuses may have occurred, in part, because police organizations were both inefficient and ineffective due to structural and organizational shortcomings that came under acute strain during the public health emergency (Ojedokun, 2021).

The Nigerian Police Force (NPF) is infamous for longstanding police abuses, including the use of violence or threats for personal monetary gain. According to Agbiboa (2015a; 2015b), this history of police brutality goes all the way back to the colonial era.

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[3] The data can be retrieved from https://acleddata.com/analysis/covid-19-disorder-tracker/

Corruption, repression, and extrajudicial killings of civilians has led the public to view the NPF as enemies rather than allies, and such negative views have been consistent throughout post-independence Nigerian history (Akinlabi 2017).

COVID-19 restrictions caused great economic and physical insecurity for marginalized groups in Nigeria because such policies created opportunities for both insurgents (such as Boko Haram) and police officers to prey upon those who must work outside the home to meet basic needs (Agbiboa, 2020). In particular, police could easily use enforcement of pandemic-related laws as an excuse for violence against civilians for personal gain, putting the most vulnerable populations at serious risk (Agbiboa, 2020). For example, the NPF has been known to stop vehicles on the roads at the security checkpoints and use violence to collect bribes from passengers (Agbiboa, 2015a; 2015b). The enforcement of COVID-19 movement restriction policies may have provided even more opportunities for the NPF to stop civilians at various checkpoints and bus stations to solicit bribes to avoid arrest and to use violence if their demands were not met (Aborisade, 2021). Residents in insecure regions, such as northeastern Nigeria, severely affected by the Boko Haram insurgency, were especially vulnerable—not only repressed by the NPF when violating movement restrictions, but easily targeted by the insurgents when not mobile (Agbiboa 2020).

Can high-speed mobile networks and social media constrain the government's violent behaviors toward civilians during the pandemic and beyond? The following sections explore policing and its relationship with social media and high-speed mobile networks.

Police Brutality and Social Media

On May 25, 2020, an African American man named George Floyd died in police custody in Minneapolis, Minnesota. Witness videos widely shared via social media showed Derek Chauvin, a white police officer, kneeling on Floyd's neck for approximately nine

minutes despite Floyd repeatedly saying he was unable to breathe until he lost consciousness and then died (Kristof, 2020). The first protests began in Minneapolis the following day in response to the viral video. Protests calling for justice for George Floyd's death and for ending police brutality against Black people spread throughout the United States, and soon the world (BBC News, 2020). Chauvin was charged with murder and civil rights violations and eventually sentenced to over twenty years in prison. Examples of police brutality against young Black men have been documented throughout American history. However, not all cases have received the same level of public attention as the case of George Floyd, nor have they frequently led to the charging of the perpetrators involved. A New York Times columnist asked readers to consider the counterfactual: "Imagine that no one had shot video of George Floyd being killed by the police in Minneapolis. There would have been a bland statement that he had died resisting arrest, and none of us would have heard of him" (Kristof, June 6, 2020). Instead, social media videos inflamed national and worldwide protests and effectively achieved accountability for lethal police violence (Kristof, June 6, 2020).

Protests emerged in Nigeria, as well. These were, in part, sparked by Black Lives Matter protests that emerged throughout the world after George Floyd's murder. They were also connected to three high-profile murders in the early phase of lockdown implementation in April. One incident involved the extrajudicial killing of a teenage girl by police in Lagos during the nighttime curfew. Protestors were also motivated by the rape and murder of two other young women by police. Videos, photos, and memes protesting police repression and violence against women were widely shared, including Twitter hashtags of #JusticeForUwa, #JusticeForBaraka, #SayNoToRape, and #EndSARS. Ultimately, social media became a crucial tool during the pandemic to identify social problems and demand solutions, including the issue of police violence (Adeniyi, 2022).

Under these circumstances, citizens' use of high-speed mobile networks has a clear objective: to increase police accountability and reduce police repression. Why should it work? Self-awareness theory provides some insight. Self-awareness theory focuses on how individuals perceive and think about themselves. The theory suggests that individuals have a heightened sense of self-awareness when they are being observed or are aware that they are being recorded. The theory is based on the idea that self-awareness is a state of mind that is triggered when an individual's attention is directed towards their own thoughts, feelings, or actions (Wicklund, 1975). This heightened state of self-awareness can lead to cognitive and behavioral changes, including increased introspection, self-evaluation, and self-regulation. As Farrar (2013, p. 2) notes, "individuals who are aware that they being observed often embrace submissive or commonly-accepted behavior."

One of the key contributions of self-awareness theory is the concept of public versus private self-awareness, which refers to the extent to which individuals are aware of how they are perceived by others. This has been shown to play a crucial role in shaping social behavior, including how individuals present themselves to others and how they respond to feedback. As Froming et al. (1981) argue,

> [A]udiences increase focus on the public aspects of the self, whereas mirrors focus attention on the private aspects of the self... Attention to the private self may result in behavior that reflects personal attitudes; attention to the public self may cause behavior to become more consistent with societal expectations (p. 476).

When personal attitudes conflict with social expectations, public performance before an audience—including online audiences—is expected to produce behavior that is deferential to social or legal expectations.

Anecdotal evidence provides support for this phenomenon. Police leaders in the U.S. have claimed that cell phone cameras and social media have constrained police behavior. The FBI Director at the time claimed that officers were reluctant to confront criminal suspects for

fear that their actions would be video recorded and then scrutinized on social media—what he called a "viral video effect" (Lichtblau, 2016, para. 2). St. Louis Police Chief Sam Dotson coined this the "Ferguson Effect" (Byers, 2014). In Chicago, Police Superintendent Eddie Johnson said that an officer in his department suffered a concussion, multiple fractures, a neck injury, and had concrete removed from her face—injuries sustained in an attack in which she refused to shoot her attacker "because she didn't want her family or the department to have to go through the scrutiny the next day on the national news" (Hayden, 2016, para. 9). Given these reports, as well as the propositions of self-awareness theory more generally, we would expect fewer reports of police repression in places with the kind of 4G mobile technology that facilitates the widespread dissemination of police misconduct. In short, any effect of lockdowns on police repression may be contingent upon high-speed mobile network proliferation. This study tests that hypothesis.

High-speed Mobile Networks in Nigeria

Bailard (2015) notes that "the technology that is presently exerting the most profound impact in developing countries is that of mobile telephony" (p. 325). It is well known that online access in developing countries is primarily achieved via cell phone access. The earliest research studying the impact of mobile technology on political violence, such as Pierskalla and Hollenback (2013), used mobile network data based on 2G technology, which enables basic communication technology suitable for calls and sending text messages. This research found that 2G technology permitted coordination and collective action that contributed to citizens' protest or political violence. Older 2G technology, however, does not allow citizens to rapidly and extensively spread video recordings and news through social media. It is therefore less effective at turning policework into public performance and less effective at providing the sort of audience that would theoretically constrain police repression. In addition, 2G technology is widespread throughout Nigeria and little variation exists across

sub-national units. By contrast, substantial variation exists for high-speed mobile technology, as demonstrated in Figure 1 showing the map of 3G and 4G coverage in Nigeria. The figure illustrates the geospatial variation in mobile network penetration in Nigeria. Variations are observed among administrative units, such as states, and within these units. 4G coverage exhibits a more distinct variation.

[FIGURE 1 ABOUT HERE]

According to a report by the Nigerian Federal Ministry of Communications and Digital Economy (2020), Nigeria significantly lags its peers in 4G proliferation. Coverage exists only in major cities and state capitals, and as of December 2019, fewer than 40% of Nigerians had 4G access. (In fact, more than 25% of Nigerians had yet to receive 3G access.) Mobile download speeds, on average, are 80% slower than in nations such as Kenya and South Africa. Nonetheless, 4G is being rapidly adopted, and Nigeria has set an ambitious goal of 90% 4G/5G coverage by the year 2025. As the predominant mode of broadband internet in the country, 4G is quickly emerging as an agent of social and economic change. This study explores its role in police repression in the context of COVID-19 lockdowns.

Methods

To estimate the causal effect of a lockdown on the government's use of violence against civilians and whether the effect is contingent upon high-speed mobile network proliferation, the difference in differences (DID) estimator and the difference in difference in differences (DDD) estimator (also known as the triple difference estimator) are used. This section provides a description of the data sources and variables used, followed by an explanation of the estimation models.

Data and Variables

The dataset is constructed by combining data from three sources: (1) the Armed Conflict Location & Event Data (ACLED) database (Raleigh et al. 2010)[4]; (2) ACAPS' COVID-19 government measures dataset that includes detailed information of what policies are implemented in responding to COVID-19 and the date of implementation[5]; and (3) mobile network proliferation statistics by sub-national units obtained from the Mobile Coverage Data.[6] The dataset contains observations from January 1, 2019, to June 30, 2020, and the unit of observation of the dataset is the *local government area-day,* where local government area (i) is a sub-national unit that is the second-largest unit following states. There are 775 local government areas and 547 days (t), for a total of 423,925 observations.

Five dependent variables measure police repression. The ACLED dataset includes an interaction variable that characterizes which political actors conflict with whom. From the ACLD dataset, three variables are generated—*SupressRioter*, *SupressProtest*, and *SupressCivilian*—each of which refers to the number of conflict events in a local government area for a given day where the ACLED event describes "suppression of demonstration [rioters] by police or military", "suppression of demonstration [protesters] by police or military" and "state suppression of civilians" (ACLED, 2019, p. 24). In addition, variables *PoliceForce* and *MilitaryForce* refer to the number of conflict events where physical force was used by the police or the military, respectively, coded based on the description of state actors in the ACLED dataset.

[4] The dataset was obtained from acleddata.com.
[5] The dataset was obtained from https://www.acaps.org/covid19-government-measures-dataset.
[6] The data was compiled from https://www.mobilecoveragemaps.com/

Some readers may ask why a study on police repression considers events involving the military (in addition to the police). In many nations, including Nigeria, the military is involved in a great deal of civilian policing. In fact, dozens of nations, including Nigeria, maintain official *gendarmeries*—military or paramilitary forces with explicit, codified jurisdiction in civilian law enforcement. In such nations, any study that omits military actions that constitute civilian policing may systematically underestimate the types of formal social control that are functionally and conceptually equivalent to police actions.[7] Throughout this paper, the term "police repression" refers to events involving private citizens and either police officers or military members—any conflict between civilians and those entities with coercive law enforcement authority.[8]

As for the independent variables, *Lockdown States* (it) is a dummy variable indicating that the given Local Government Area (LGA) belongs to a state where the lockdown measures were imposed.[9] *LockedPeriod* is a binary variable indicating the periods during which the government implemented the state-level lockdown.[10] If a given day falls during the

[7] Bittner (1970) defined the police role in society as the provision of services in the community that necessitate the potential use of force for their successful delivery. This definition reflects the unique authority that society grants to the police: the right to use coercive force when necessary, often at the officer's discretion, regulated within a legal framework. Military and paramilitary forces often have a significant influence on how laws are enforced, public safety is maintained, and order is preserved, and in some cases, their role might even eclipse that of traditional police forces. Section 217(2)(c) of Nigeria's 1999 Constitution explicitly grants the military with policing authority in aid of civil authorities to restore order when called upon to do so—and in actual practice, they frequently exercise this authority even beyond their official constitutional limits. Therefore, to fully understand the landscape of formal social control in such contexts, it is crucial to consider the actions of these military and paramilitary forces. They can represent a substantial portion of the state's capacity to enforce laws and maintain order, particularly in situations where civil unrest or other forms of instability are common.

[8] Conflicts with foreign adversaries or insurgent groups (such as Boko Haram) are excluded.

[9] Seven states—Lagos, Ogun, Kano, Delta, Jigwa, Bauch, and Yobe—and the Federal Capital Territory implemented the lockdown.

[10] Different States have implemented the lockdown dates during different periods. For Lagos and Ogun, the lockdown dates were March 30 through May 3, and May 18 through May 31; For Kano, April 17 through April 23, and April 28 through June 2; for Delta, April 1 through April 28; for Yobe, April 7 through April 27; for Jigwa, April 7 through April 20; for Bauchi, March 29 through April 20, and May 11 through May 20; and for Federal Capital Territory, March 29 through May 3; and May 18 through May 31.

days under which state-level lockdown measures were implemented, *LockedPeriod* is given 1 (otherwise, 0). *Treatment* (it) is a binary variable that indicates whether the given LGA is subject to a state-wide lockdown on day (t), based on the state (i) it belongs to. The *4G Proliferation*$_i$ variable is a binary time-invariant variable indicating whether a local government area has positive coverage of high-speed 4G mobile networks (*4G Proliferation* $_i$ = 1) or no coverage (*4G Proliferation* $_i$ = 0). *Time* (monthly) and *State* fixed effects are controlled individually in the main models. The DID and DDD estimators are estimated using the ordinary least squares (OLS) estimation.

Estimation

To examine whether the implementation of the lockdown measures affects police repression, the following standard difference in differences (DID) estimation equation can be used:

$$Y_{it} = \beta_0 + \beta_1 StatesLocked_{it} + \beta_2 LockedPeriod_{it} + \delta_1 (StatesLocked_{it} \times LockedPeriod_{it}) + \varepsilon_{it} \quad (1)$$

where the main coefficient of interest would be δ_1, which estimates the effect of the lockdown implementation on police repression. A Difference-in-Differences (DID) estimator compares "changes" in policy outcomes before and after the enactment of lockdown policies to "changes" in outcomes in control areas where the policies are not implemented. By examining pre-and-post differences within each group, with the treatment group being *LockedStates* and the rest serving as the control group, underlying time-invariant contextual differences in outcome variables are eliminated (Goodman-Bacon and Marcus, 2020.)

This standard DID specification, however, can be too restrictive by making a common trend assumption. Therefore, it is often advisable to allow cross-section and time fixed effects separately, which controls for more variation introduced across cross-section and time (Wing,

Simmon and Bello-Gomez, 2018). Considering the significant variation in conflict risks across different local government areas and time periods, the following DID estimation model controls for cross-sectional and temporal variation, as a main estimation model:

$$Y_{it} = \beta_0 + \sum \beta_{1i} States_i + \sum \beta_{2i} Time_t + \delta_1 Treatment_{it} + \varepsilon_{it}$$

(2)

where $State_i$ and $Time_t$ refer to the state and monthly fixed effects. The variable $Treatment_{it}$ indicates that the unit of observation (LGA–*day*) is in the treated (lockdown) states during the lockdown implementation periods (where 1 = yes and 0 = no).[11] The main coefficient of interest, δ_1, estimates the effect of the lockdown on police repression.

It is still possible, however, that unmeasured confounders still exist at the cross-sectional level that are time-invariant, as well as time-varying confounders that are invariant to the cross-sectional unit. If a time-varying confounder affects states/local government areas differently or vice versa, the DID estimator above can produce biased estimates. For example, police may be more likely to use violence where 4G proliferation is low: because 4G proliferation varies significantly within each state, the DID estimate would produce the combined effect of the difference in lockdown implementation and the variation in high-speed mobile network proliferation. Under this scenario, the triple difference (DDD) estimation can result in better estimates. The DDD estimate compares the DID estimate

[11] If the lockdown was imposed on the states during the same period, $Treatment_{it}$, is essentially the interaction between $LockedStates_i$ and $LockedPeriod_t$. The lockdown measures were imposed by states, however, and the implementation periods vary by states—although many overlap. Despite the variation, $LockedPeriod_t$ is a binary indicator. Therefore, it captures the implementation of lockdown in any state on a given day, rather than the state where an LGA is located. Since the interaction term in the standard DID equation (1) can mistakenly capture the lockdown implementation for an LGA-day, even when that specific LGA-day is not directly affected by a lockdown, we refrain from utilizing this equation for our estimation.

among the high-speed mobile network areas compared to the DID estimate among the areas without such 4G networks. To test whether the effect of lockdown on police repression is conditioned upon high-speed mobile networks, the following triple difference (DDD) equation is estimated:

$$Y_{it} = \sum \beta_{1i} States_i + \sum \beta_{2t} Time_t + \delta_1 Treatment_{it} + \delta_2 4G \text{ Pr}o\,liferation_i + \delta_3(Treatment_{it} \times 4G \text{ Pr}o\,liferation_i) + \varepsilon_{it}$$ [12]

(3)

where the main coefficient of interest (δ_3) provides an estimate of the difference in the effect of lockdown on government's repression by the level of high-speed mobile network proliferation.

Results

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[12]A standard triple difference equation would employ the following model specification. The impact of the lockdown would be denoted by δ_4, which represents the coefficient for the interaction among *LockedStates*$_i$, *LockedPeriod*$_t$, and *4G Proliferation*$_i$.

$$\begin{aligned} Y_{it} = \beta_0 &+ \beta_1 LockedStates_i + \beta_2 LockedPeriod_t + \delta_1 4G\ Proliferation_i \\ &+ \delta_2(StatesLocked_i \times LockedPeriod_t) \\ &+ \delta_3(StatesLocked_i \times 4G\ Proliferation_i) \\ &+ \delta_4(StatesLocked_i \times LockedPeriod_t X \times 4G\ Proliferation_i) + \varepsilon_{it} \end{aligned}$$

Once again, we utilize an alternative specification shown in (3) to precisely capture the implementation of the lockdown for a specific LGA-day, while also controlling for cross-sectional and time-fixed effects.

This section presents the difference in difference (DID) and triple difference estimations to examine the effects of lockdown on police repression against civilians and whether the effect is conditioned by the proliferation of the high-speed mobile network.

Table 1 presents the DID estimation results based on equation (2) above. The coefficient of *Treatment* gives the estimated effect of the lockdown on police repression. There is no significant causal effect of lockdowns on any measure of police repression. To determine if the lack of impact from lockdown on police repression is due to variation in high-speed mobile data, we now turn to the triple difference estimation results.

[TABLE 1]

Table 2 presents the triple difference estimation results based on equation (3) above, showing separate DID estimates for LGAs based on their level of 4G proliferation per LGA. The constant coefficient represents the average number of instances of police repression per day in an LGA (Local Government Area) when there is no lockdown in place. This applies to LGAs that are not affected by the lockdown policy and are also not located in an area with widespread 4G coverage. The estimated constant values are close to 0 for *SupressRioter*, *SupressProtest*, and *PoliceForce*. For *SupressCivilian*, the value is approximately 0.001, and for *MilitaryForce*, it is approximately 0.0014. These values indicate that instances of police repression are rare when we analyze data at the LGA-day level.

The coefficient for *Treatment* represents the DID estimate in the areas without 4G mobile data. For measures of police repression—*SupressCivilian* (state suppression of civilians, including by arrest) and *PoliceForce* (a conflict event where the police force is involved)—lockdown produced less police repression if the local government areas lacked high-speed mobile data, shown by the negative and statistically significant estimates for the Treatment variable, -0.0003 and -0.0006, respectively.

A positive coefficient for *4G Proliferation* represents the average increase in the number of police repression incidents in an LGA (Local Government Area) with a 4G mobile data network per day, compared to an otherwise equal LGA that lacks a 4G network, when no lockdown was implemented in the state on that day. These effects, referring to as "net high-speed mobile technology effects," were found in *SupressRioter* (0.0002), *SupressProtest* (0.0001), and *PoliceForce* (0.0003). The findings indicate that in areas with high-speed mobile data, Nigerian residents experienced higher levels of suppression against rioters and protesters, as well as increased interference by the police, compared to those living in LGAs without such a high-speed mobile network, even in the absence of a lockdown.

The coefficient for $Treatment_{it} \times 4G\ Proliferation_i$ represents the difference in the lockdown effect on police repression between areas with and without substantial high-speed mobile data proliferation. In areas with high-speed mobile data, the lockdown increased the incidence of *PoliceForce* by 0.0016 incidences. Given that, on average, any LGA-day experiences 0.00075 conflict events where the police force is involved, this coefficient represents a substantively large increase in police repression.

[TABLE 2]

Considered together, the effect of lockdown on police–public conflict (*PoliceForce*) is conditioned upon the level of the 4G proliferation. The lockdown effect is positive and higher in magnitude in the areas with substantial high-speed mobile data proliferation than it is in places without; in fact, lockdown had *negative* effects on *PoliceForce* in places with little 4G proliferation.

Discussion

Following the outbreak of COVID-19, news accounts of police brutality while enforcing restrictive COVID-19 policies were reported frequently in countries throughout

sub-Saharan Africa. This study examined the effect of implementing lockdown measures—the strictest form of restrictive policy—on the government's repression against civilians in Nigeria, a country where systematic police violence has existed throughout its post-independence history. During the pandemic, people in Nigeria actively expressed their frustration against police brutality and shared evidence of its continued existence through social media. To evaluate the conditional effects of information-sharing through social media—where theory would predict that the online "public performance" of policing would reduce police repression—this study also examined whether 4G proliferation constrained the government's repression of civilians.

Our findings reveal a rather nuanced effect of COVID-19 lockdowns on peace and conflict in Nigeria, as other research has found (Ossai, 2021). Lockdown increased police involvement in states where the lockdown measures were implemented—but only in those areas with more 4G proliferation. High-speed mobile networks did not have the predicted effect of reducing police repression by facilitating the rapid, widespread sharing of police–public conflicts via social media. In fact, such conflicts have become more common. Additionally, we found that high-speed mobile technology has a separate effect from the lockdown measures, specifically contributing to the facilitation of police repression. In regions where high-speed mobile data is accessible, Nigerian residents experience a higher occurrence of police repression compared to individuals residing in Local Government Areas (LGAs) without access to such networks. This repression encompasses the suppression of rioters and protesters, as well as a greater frequency of police using force.

This study provides two contributions to the literature. First, while many studies have explored various aspects of the COVID-19 pandemic (and associated restrictions) on the police in Western nations—particularly the United States—fewer have examined its effects in nations with even more troubled policing institutions, including those in sub-Saharan Africa.

We discovered evidence of an increase in certain forms of police repression during the COVID-19 lockdowns in Nigeria, which was contingent on the area's access to a high-speed mobile network that facilitated the police's repressive actions. Second, this study contributes to the existing literature on the impact of high-speed mobile networks on policing in Africa. While evidence from the U.S. and elsewhere has suggested that rapid and widespread sharing of police–public conflicts via mobile devices may constrain police repression, such effects were not apparent in Nigeria. In particular, the "net high-speed mobile network effect" demonstrates that police repression is more prevalent in areas with a widespread high-speed mobile network, even in locations that are not currently under lockdown. This effect further strengthens the evidence suggesting that in Nigeria, the police wield excessive power with inadequate oversight. Additionally, it highlights the ineffectiveness of public information-sharing in holding the police accountable for their repressive actions.

There are a few limitations that provide opportunities for future study. First, the findings of this study are based on data regarding the Nigerian case and may not be generalizable throughout Africa, warranting studies in other contexts. Second, the findings suggest that 4G proliferation in Nigeria does not constrain but facilitates repressive government behaviors. Additional studies can be conducted to explore the causal mechanisms through which how high-speed mobile networks facilitate government repression in Nigeria. For instance, high-speed mobile networks may facilitate the intelligence-gathering operations of the police, including anticipating or responding to dissent and easily identifying dissidents for targeted state violence. A recent survey of police in Nigeria, for instance, found that nearly half of all officers identified intelligence-gathering as the primary purpose for social media use in policing (Peters & Ojedokun, 2019). Another study involving interviews with Nigerian police officers found that surveillance and intelligence-gathering were primary motives behind the adoption of social media, and that it was being widely adopted despite

serious shortcomings in training, policy, and law (Uduma et al., 2020). In short, an exploration of the causal mechanisms may help explain when and where mobile technologies increase rather than decrease police repression.

Social media can effectively ignite protests and riots, both online and offline, and may encourage government repression in response. This study found a positive association between high-speed mobile network proliferation and various police repression measures, demonstrating that information-sharing through social media facilitates rather than constrains the government's repressive behaviors in Nigeria. Police corruption and repression in Nigeria have been longstanding problems, and the government appears to have no appetite to address them (Agbiboa 2015a; 2015b). The results herein suggest that citizens' political participation alone may not be effective in constraining the behavior of government agents. Nigerians' continued political participation through social media has received much attention domestically and internationally, leading international organizations such as the Office of the United Nations High Commissioner for Human Rights (OHCHR) to call governments to action and put pressure to reduce excessive government repression (WHTC, 2020, April 27). It remains to be seen whether sustained active political participation via social media by Nigerian citizens may, in the long term, motivate effective police and government reform.

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Table 1 Difference in Difference Estimation Results

	(1)	(2)	(3)	(4)	(5)
VARIABLES	*SupressRioter*	*SupressProtest*	*SupressCivilian*	*PoliceForce*	*MilitaryForce*
Treatment	0.0007	-0.0002	0.0003	0.0006	-0.0007*
	(0.0004)	(0.0002)	(0.0004)	(0.0006)	(0.0004)
State FE	Yes	Yes	Yes	Yes	Yes
Monthly FE	Yes	Yes	Yes	Yes	Yes
Constant	0.0002	0.0001	0.0010***	0.0008**	0.0011***
	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0004)
Observations	423,378	423,378	423,378	423,378	423,378
Adjusted R^2	0.0004	0.0006	0.0004	0.0011	0.0148

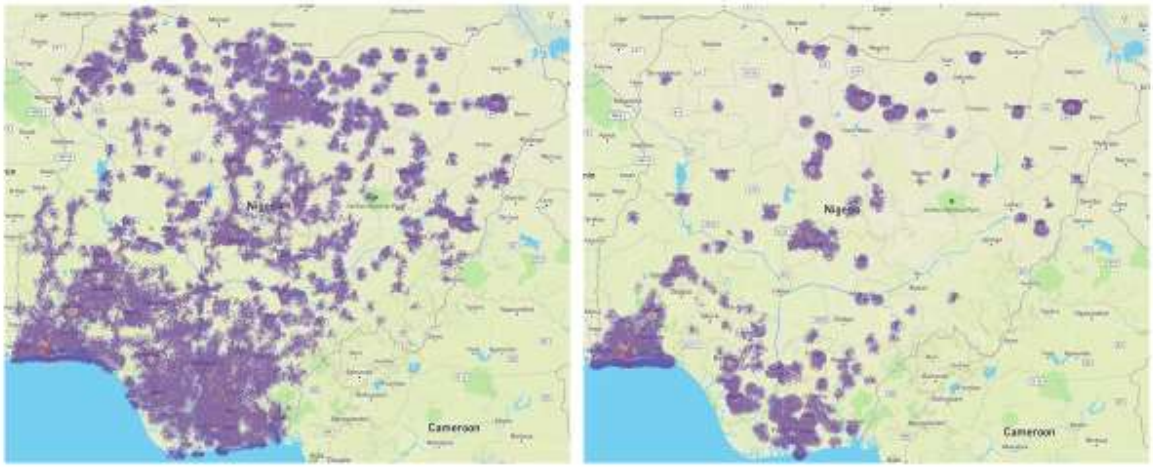
Notes. Table by authors. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2. Triple Difference Estimation Results

	(1)	(2)	(3)	(4)	(5)
VARIABLES	*SupressRioter*	*SupressProtest*	*SupressCivilian*	*PoliceForce*	*MilitaryForce*
Treatment	-0.0002	-0.0001	-0.0003**	-0.0006***	-0.0008
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0007)
4G Proliferation	0.0002***	0.0001***	0.0001	0.0003***	-0.0003*
	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0002)
Treatment × 4G Proliferation	0.0011*	-0.0001	0.0008	0.0016**	0.0001
	(0.0006)	(0.0002)	(0.0005)	(0.0008)	(0.0008)
State FE	YES	YES	YES	YES	YES
Monthly FE	YES	YES	YES	YES	YES
Constant	0.0001	-0.0000	0.0009***	0.0005	0.0014***
	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0004)
Observations	423,378	423,378	423,378	423,378	423,378
Adjusted R^2	0.0005	0.0006	0.0004	0.0011	0.0148

Notes. Table by authors. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Figure 1. 3G vs 4G Coverage Map in Nigeria



Note. The left panel shows 3G coverage while the right panel shows 4G coverage. The map is retrieved from Mobile Coverage Maps. The darker a given location is, the higher the cellular coverage. (Figure courtesy of GSMA, https://www.mobilecoveragemaps.com/)