

# Multidimensional poverty and conflict events in Nigeria over time

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*The Igbo culture says no condition is permanent. There is constant change in the world.*

*Chinua Achebe, There Was a Country: A Personal History of Biafra*

## 1 Introduction

In the early 2000s, [Croft et al. \(2014\)](#) posit that ‘not a single low-income conflict affected country has yet achieved the Millennium Development Goals.’ According to [World Bank \(2011\)](#), compared to people living without conflict ‘the estimated one and-a-half billion people living in conflict-affected countries are substantially more likely to be undernourished, less likely to have access to clean water and education, and face higher rates of childhood mortality.’ On the relationship between monetary poverty (\$1.90) and conflict, [World Bank \(2020\)](#) notes a positive relationship between poverty and past conflict at the sub-national level: ‘poverty rates tend to be higher, on average, in areas with higher levels of conflict debt, although this correlation is not strong.’

Our article contributes to the Special Issue and the wider literature by addressing two gaps within the puzzle of conflict and poverty. First, we investigate how the concurrent changes in conflict events and poverty interact over time at the sub-national level and across state boundaries. By conflict events we mean any type of event recorded by the Armed Conflict Location Event Data Project (ACLED), which concern battles, explosions, remote violence, violence against civilians, protests, riots, and strategic developments. Second, we use a novel, yet widely established concept of poverty, namely

multidimensional poverty, which encompasses several forms of poverty. The latter allows us to study both the intensity as well as the incidence of multidimensional poverty over time. We focus on Nigerian states between 2008 and 2018, since Nigeria makes for a particularly relevant case study. Nigeria has witnessed a sharp rise in violent conflict events during the period of our study, especially via Boko Haram related events in the North of the country, and in herder-farmer and oil-related conflict events in other parts of the country. These events have increased in number and intensity (fatalities). Furthermore, despite being Africa's second largest economy, Nigeria is home to the largest number of multidimensionally poor people in Africa ([Jennings and Oldiges, 2020](#)), and second largest globally ([Alkire, Kanagaratnam and Suppa, 2020](#)). Simultaneously, levels and intensity of poverty vary substantially across states, especially between the Northern state – some which are among the world's poorest regions – and the Southern states. And while conflict events have been increasing unevenly and in different patterns across the country over the years, trends in levels and intensity of poverty have been heterogenous as well.

Methodologically, and similar to other contributions to this Special Issue (see especially [Rugo, Davis, and Alderdice](#)), we emphasize people's experiences in addition to observed phenomena and thus promote dialogue among differing epistemologies and methodologies as a means to enhance understanding of changing conflict dynamics ([Della Porta and Keating, 2008](#)). Even though we rely in our data collection on observed conflict events as [Idler and Tkacova](#) do elsewhere in this Special Issue, our approach towards the experience of conflict is people-centered in so far as we consider multiple simultaneously experienced deprivations, building on Amartya Sen's capability approach ([Sen, 2001](#)). According to Sen's capability approach, income is considered as a 'means to an end,' whereas achievements in various 'functionings,' such as leading a healthy and long life

or being educated, capture people's lived experience of their quality of life. We build on this, using a counting methodology ([Alkire and Foster, 2011](#)), that helps quantify people's lived achievements or the lack thereof – deprivations – in various dimensions. We use household level data for three rounds of the regionally representative Demographic and Health Surveys (DHS) of 2008, 2013, and 2018, and compute individual deprivation profiles, following the routines used for the global multidimensional poverty index (MPI) ([UNDP and OPHI, 2020](#)). Counting the simultaneous deprivations of people living in conflict affected areas, post conflict-areas, and peaceful areas helps understand how well-being changes with conflict, and how conflict may halt or reverse previous trends of poverty reduction.

Our measure of conflict events is an accumulated sum of conflict events as recorded by ACLED at the regional level for 2003 to 2018, and for different time intervals in between. As per the ACLED definition, 'The fundamental unit of observation in ACLED is the event. Events involve designated actors e.g., a named rebel group, a militia or state forces. They occur at a specific named location (identified by name and geographic coordinates) and on a specific day' ([ACLED, 2021](#)). Aggregating events of conflict by broader groups at the regional level, we generate a regional panel of conflict events that considers fatalities and the different types of conflict.

To estimate the relationship between conflict events and poverty, we undertake a descriptive analysis of the DHS-ACLED regional panel and an econometric one, in which we control for state fixed effects. We also address the changing nature of conflict within zones and across neighboring states. For this purpose, and parallel to [Idler and Tkacova in this Special Issue](#), we compare border regions in a spatial regression framework,

acknowledging that ‘border regions are more similar in terms of peoples experiences and perceptions of conflict than countries.’

While our analysis stays clear of claiming causality, we show how poverty reduction and increases may go hand in hand with a rise in conflict events, demonstrating the policy relevance of our findings. We find that conflict arises not necessarily in the poorest Nigerian states, but in some of the relatively better-off states. Furthermore, we find that while levels of the MPI decreased between 2008 and 2013, conflict may have played a major role in halting these trends, if not reverting them. Our empirical findings based on spatial regression framework point toward conflict spillovers or indirect associations between conflict and MPI levels: the likelihood of a conflict event taking place in any Nigerian state is positively associated with lower MPI levels in that state *or its immediate neighbors*.

Our findings add to the literature that studies the relationship between the changing character of conflict and well-being and poverty as well as development. Elsewhere in this Special Issue, [Dursun-Özkanca](#) demonstrates how economic inequalities between conflict parties can influence conflict dynamics including spatial changes in conflict and hinder the resolution of armed conflict at the interstate level. Our study complements these insights by shedding light on the relevance of development and inequalities at the intra-state level. It aligns with recent research that uncovers sub-national heterogeneity in terms of the conflict-poverty nexus using household-level data in combination with localized and geo-coordinated conflict data ([Verwimp et al., 2018](#); [Mueller and Techasunthornwat, 2020](#)). Since we account for deprivations in health and education in a multidimensional poverty framework, and find statistically significant correlations between conflict and poverty, our findings reflect recent evidence on conflict in Nigeria being associated

negatively with monetary poverty, and with food insecurity (see e.g. [Kaila and Kalam, 2019](#)), and school enrolment ([Bertoni et al., 2019](#)). Lastly, our empirical findings on spatial conflict spillovers complement [Davis, Alderdice](#), as well as [Idler and Tkacova](#) elsewhere in this Special Issue. underscoring the importance of territoriality, place, and space.

Our findings provide a new and multidimensional lens on where conflict-prevention needs to take place and how conflict-prevention is a necessary condition for eradication of poverty in all its forms.

The paper is structured as follows: we first provide a background on the poverty-conflict nexus and endogeneity (Section 2), followed by an introduction of data and methodologies used to estimate poverty and conflict (Section 3). Based on our DHS-ACLED state-panel, we describe the nature of poverty and conflict in Nigeria between 2003 and 2018 (Section 4), followed by an empirical estimation of the link between the two at sub-national level (Section 5). We provide some discussion of the results and concluding remarks in Section 6.

## **2 Background on the poverty-conflict nexus and deprivations as people-centered poverty**

*People-centered measure of the quality of life or lack thereof*

As the most populous African nation, Nigeria is home to the highest number of poor people globally, according to monetary poverty ([World Bank, 2020](#)). Many parts of Nigeria risk not reaching the first Sustainable Development Goal (SDG): the eradication of poverty (see e.g., [Sumner et al., 2020](#)). SDG 1 entails not only eradicating extreme

poverty as measured with a monetary poverty line of \$1.90 a day, but also SDG target 1.2.2. The latter entails to reduce by half the ‘proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.’<sup>1</sup> This widely accepted notion of multidimensional poverty builds on Sen’s capability approach (Sen, 2001) to capture people’s experience of poverty in its many forms.

Arguably, this broad notion of poverty is most often measured by the global Multidimensional Poverty Index (MPI), as reported in the UNDP Human Development Report since 2010. According to the 2020 global MPI, sub-Saharan Africa is the poorest region globally, with more than 593 million people living in multidimensional poverty, contributing more than 40 percent to the global number of MPI poor people (Jennings and Oldiges, 2020; UNDP and OPHI, 2020). In a cluster of neighboring sub-national regions across the Sahel, poverty rates are around 90 percent or higher, as for example in Niger, Chad, Mali, and northern Nigeria (Jennings and Oldiges, 2020).

### *Poverty and conflict*

For several sub-Saharan African countries including Nigeria, poverty reduction has been slow in the early 2000s, with annual reductions in the headcount ratio of barely one percentage point (e.g., Nigeria, Ethiopia, Cameroon) (Jennings and Oldiges, 2020). This indicates a standstill in terms of poverty eradication during the last decade (Alkire, Nogales, Quinn and Suppa, 2020). Simultaneously, many of the poorest African countries have witnessed armed actors engaged in conflict since the early 2000s. Prominent examples are Al-Qaeda and Islamic State linked groups across the Sahel, Boko Haram in bordering regions of Nigeria, Niger, Chad, and Cameroon, violent groups in East Africa

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<sup>1</sup> See: <https://unstats.un.org/sdgs/metadata/?Text=&Goal=1&Target=1.2>

across Somalia stretching into Kenya, and actors involved in domestic conflicts within for example the Democratic Republic of Congo and the Central African Republic (see for example [World Bank, 2011, 2020](#)).

### *Endogeneity*

In the development economics literature on the relationship between conflict and development, the relationship between poverty and armed conflict is considered endogenous, implying reverse causality. An emerging strand of literature which employs household level data, shows for example the long term and adverse health effects of wars on child and adolescent growth ([Akresh et al., 2012, 2011](#)). Methodologically speaking, to circumvent the problem of endogeneity, [Bru`ck et al. \(2019\)](#) explains that ‘the strategy of instrumenting conflict exposure with the distance to geographical areas of maximum conflict intensity which could be either the border or the capital of a country is widespread in the empirical literature’ ([Bru`ck et al., 2014; Justino and Verwimp, 2013; Adelaja and George, 2019; Verwimp et al., 2018; Justino et al., 2013; Blomberg et al., 2006](#)). Similar to [Idler and Tkacova](#) in this Special Issue, while we do not employ an instrumented variable per in our empirical methodology, our spatial regression framework allows accounting for distances to conflict zones.

Previously, causality had been proven largely for the other direction (see for example [Fearon and Laitin, 2003; Collier and Hoeffler, 2004](#)). For instance, [Miguel et al. \(2004\)](#) show in a macro quasi-experimental study covering 41 African countries that a negative growth shock has led to an increase in conflict during 1981 and 1999.

Pondering on why there is less evidence pointing toward the other direction of causality [Blattman and Miguel \(2010\)](#) argue that it may be due to the lack of data on

conflict-related damage, and economic conditions in conflict and post-conflict societies. Moreover, as [Verwimp et al. \(2018\)](#) stress, there is little empirical evidence supporting the fact that poverty breeds conflict. They clarify that, while there is higher prevalence of violent conflict in low-income countries, there is hardly any empirical evidence of a marked concentration of perpetrators of armed conflict among the poor ([Verwimp, 2005](#); [Krueger et al., 2007](#)). *A priori*, we can therefore not assume that conflict is likelier to occur in poorer regions of Nigeria.

### **3 Data and methodology for estimating poverty and conflict**

#### **3.1 Poverty data: DHS**

We use the latest three and standardized rounds of the Demographic Health Survey (DHS) – 2008, 2013, and 2018 – to estimate multidimensional poverty consistently at the sub-national level, across all Nigerian states. The DHS is unique for including questions that allow to calculate anthropometric measures of underweight and stunting as well as various indicators of education and living standards. Standardized globally and largely also over time, the DHS makes comparisons over time and across countries and across sub-national regions feasible. For the years 2013 and 2018, we rely on state-level global MPI estimates as calculated by [Alkire, Kovesdi, Mitchell, Pinilla-Roncancio and Scharlin-Pettee \(2020\)](#). For 2008, we rely on our own estimates of state-level global MPI as these are not published elsewhere. While we retrieve state-level population shares from the DHS, we rely on year-wise population totals for Nigeria from [UNDESA \(2020\)](#).



### 3.2 The Alkire-Foster method

The global MPI measures acute poverty reflecting the three dimensions of health, education, and living standards. Spanning ten indicators in total, each dimension is weighted by one third and equal weights are applied within each dimension. The indicators for health are nutrition and child mortality; for education they are school attendance and years of schooling; and for living standards they are drinking water, sanitation, electricity, cooking fuel, housing, and assets. The global MPI has two components: the incidence and the intensity of poverty. The incidence or the proportion of the multidimensionally poor people is the headcount ratio ( $H$ ) of multidimensional poverty. With a poverty cut-off of one third, any person that is deprived in at least one third of the weighted indicators is identified as MPI poor. The average intensity ( $A$ ) of multidimensional poverty reflects the average deprivation share among the poor. The *MPI* is thus the product of  $H$  and  $A$ :  $MPI = H \times A$ . Since for each indicator an indicator-specific cut-off is applied (see [UNDP and OPHI, 2020](#), for more details), the global MPI essentially relies on a dual cut-off approach following closely the Alkire-Foster counting method ([Alkire and Foster, 2011](#)). For the purpose of this paper, only the state-level *MPI* is of relevance.

### 3.3 Conflict data: ACLED

We rely on conflict data as collected by the Armed Conflict and Local Events Database ([ACLED, 2021](#)). Just as [Idler and Tkacova](#) in this Special Issue for their analysis of armed conflict in Nigeria, we also consulted conflict data from the Uppsala Conflict Data Program (UCDP). We find that for the purpose of our study ACLED is more suitable as also argued by [Eck \(2012\)](#), since ACLED allows us to account for the different types of

conflict events, which may or may not involve fatalities. Importantly, we can distinguish between different types of conflict events.

[Krause](#) argues elsewhere in this Special Issue that, to fully understand dynamics of insecurity and how trends in violence evolve long-term, one should adopt a holistic vision of contemporary forms of conflict, violence, and insecurity beyond armed conflict. Similarly, [Davis](#) in this Special Issue demonstrates how, in Mexico, violence experienced as armed conflict is not captured in conventional categorizations of conflict events and yet is crucial to grasp contemporary conflict dynamics. Similarly, we include all types of conflict events including non-fatal ones such as riots, protests, and demonstrations, as well as violence against civilians, as these may impact or be spurred by the quality of life and thus poverty. To the best of our knowledge, UCDP would not allow us to do so, as an event within the UCDP georeferenced event dataset (GED) is defined as follows on the UCDP website ([UCDP, 2022](#)): ‘The incidence of the use of armed force by an organized actor against another organized actor, or against civilians, resulting in at least 1 direct death in either the best, low or high estimate categories at a specific location and for a specific temporal duration ([Sundberg and Melander, 2013](#)).’

Since we are also interested in non-fatal events of conflict, we choose ACLED as the main source of conflict events.

### **3.4 Aggregating conflict events**

We aggregate ACLED data on conflict events by type at the state-level and for each year from 2003 to 2018, and produce time intervals of five years. For each state, we calculate year-wise totals of the incidence of conflict events, i.e., a counter of conflict event, and

the number of total fatalities, separately. We group available ACLED sub-event types as listed in [ACLED \(2021, Table 2\)](#) into four broad categories as follows:

1. Battles which include sub-events of: Armed clash, Government regains territory, Non-state actor overtakes territory
2. Strategic developments which include sub-events of: Agreement, Arrests Change to group/activity, Disrupted weapons use, Headquarters or base established, Looting/property destruction, Non-violent transfer of territory, Other or Explosions and remote violence which include sub-events of: Chemical weapon, Air/drone strike, Suicide bomb, Shelling/artillery/missile attack, Remote explosive/landmine/IED, Grenade
3. Riots or protests which include sub-events of: Peaceful protest, Protest with intervention, Excessive force against protesters, Violent demonstration, Mob violence
4. Violence against civilians which include sub-events of: Sexual violence, Attack, Abduction/forced disappearance

Using as many events as possible, we can distinguish riots or protests (type 3), which may or may not involve fatalities, from for example military clashes (type 1) which typically have more fatalities. For our analysis of a people-centered approach to poverty and conflict, it is important to account for ‘violence against civilians’ (type 4) as a separate type of conflict event since it has repercussions on peoples’ lives without necessarily involving fatalities. By doing so we aim to capture a more holistic and dynamic view of conflict and violence, which [Krause](#) argues for elsewhere in the Special Issue.

We aggregate conflict events by time intervals of 2003-2007, 2008-2012, and 2013-2017, so that all state-level poverty estimates for 2008, 2013, and 2018 are aligned to a five year time period of previous conflict events.

## **4 Poverty and conflict in Nigeria over time**

### **4.1 Trends and the changing forms of multidimensional poverty**

Nigeria is both the most populous African country and the poorest, with almost 100 million people living in multidimensional poverty ([Jennings and Oldiges, 2020](#)). According to extreme monetary poverty, 50 million people live below the national poverty line - more than anywhere else in the world [National Bureau of Statistics \(2020\)](#).

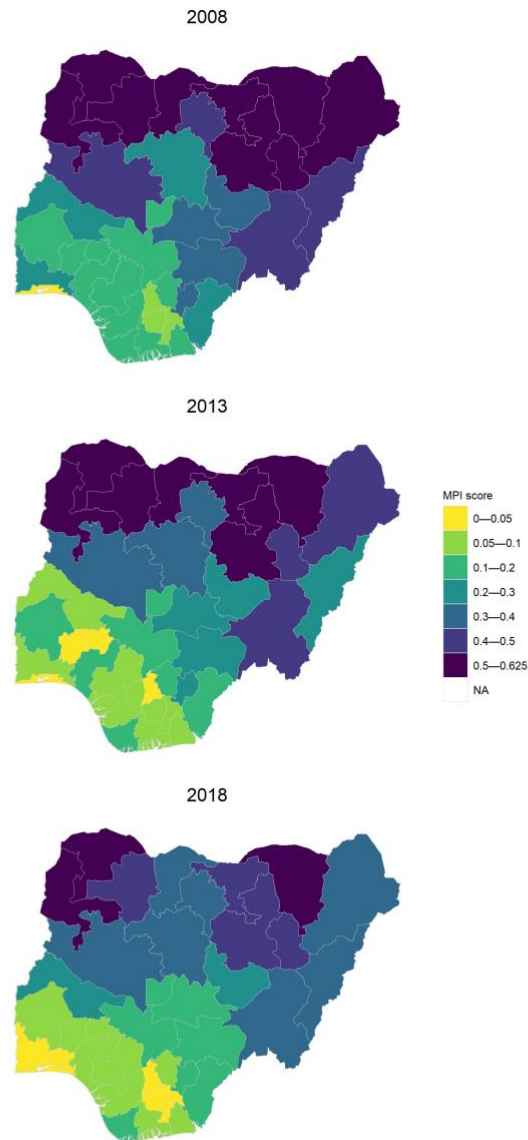
We study the period for which we have data on multidimensional poverty at the state-level. We show in Figure 1 how the *MPI* decreased across most states between 2008 and 2013 but stagnated or increased between 2013 and 2018. The pattern of a North-South divide that is known for monetary poverty [National Bureau of Statistics \(2020\)](#) is also evident for multidimensional poverty. The poorest states are located in the North, bordering Niger and Chad. Many of these states in the predominantly Muslim Northeast saw a decline in the *MPI* between 2008 and 2013, visibly so in the neighboring states of Borno, Gombe, and Adamawa. While there was little improvement in the far Northwest, some states like Kano reduced the *MPI* between 2008 and 2013, while Kaduna saw an increase. In the North Central and Southern parts of Nigeria the *MPI* mostly decreased, promising progress and an improvement in overall well-being.

During the second period of our trend analysis, we find that in many states the progress made in reducing the *MPI* stagnated and in some instances, it was reversed. For example,

in Adamawa State in the Northeast, the MPI decreased from 0.467 to 0.277 between 2008 and 2013, but then increased to 0.332 by 2018. During the same periods, the headcount ratio of multidimensional poverty moved from 80 percent to 57 percent and then back up to 63 percent (see Table [A.1](#)).

The relatively less poor North Central states of Kwara, Oyo, and Ekiti manifest a similar pattern (see Table [A.1](#)). Additionally, several Southern states in the Niger Delta with much lower levels of MPI saw a reduction in the incidence of MPI between 2008 and 2013, but either only little progress (Akwa Ibom, Rivers) or a reversal (Bayelsa) between 2013 and 2018 (see Table [A.1](#)).

**Figure 1:** MPI score in 2008, 2013, and 2018



Notes: Calculated by authors using data computed from Alkire et al (2020) based on Nigeria Demographic and Health Survey 2013 and 2018. The underlying shp-file from the Demographic and Health Surveys Program (2020). Conflict data are from the Uppsala Conflict Data Programme (UCDP).

## 4.2 Dynamics and actors of conflict events

To provide a background on various conflicts in Nigeria, [Kaila and Kalam \(2019\)](#) and [Nwankpa \(2014\)](#) group these into three broad categories that vary by region and type of actors. One, militant groups have been operating in the oil-rich Niger Delta across several states, engaged in activities ranging from kidnapping and robbery to attacks on petroleum installations and attacks on state institutions. For example, the ‘Movement for the Emancipation of the Niger Delta’ (MEND) conducted attacks against petroleum plants and the government between 2003 and 2013, followed by attacks from the ‘Niger Delta avengers’ (NDA) since 2016 among others.<sup>2</sup>

Second, there have been ethnic communal conflicts between communities of herders and farmers largely in the Northwest, North Central and also in Adamawa in northeastern Nigeria ([Guardian, 2017](#)).

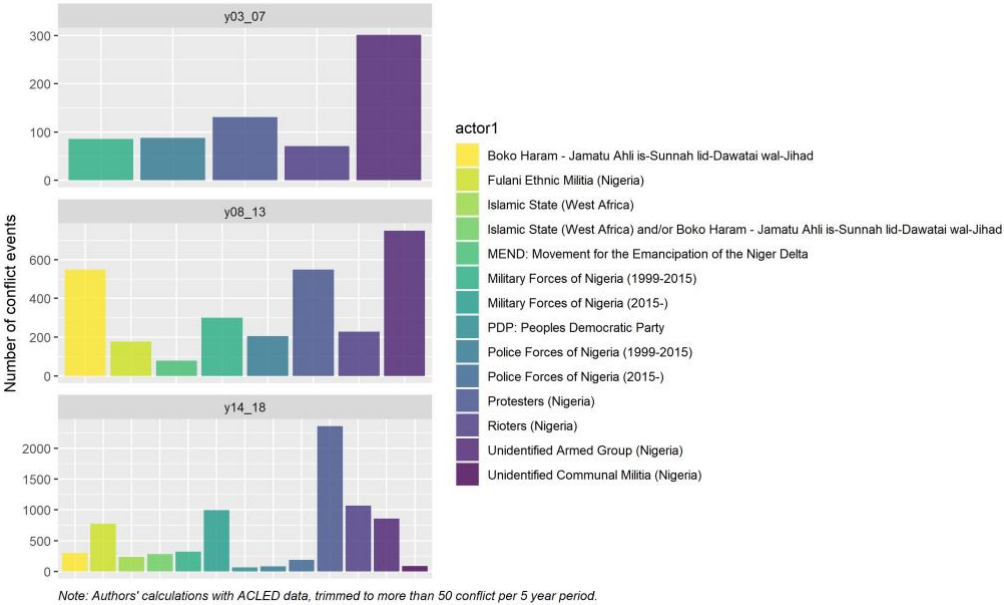
And thirdly, the Northeast of Nigeria has witnessed the violent arrival of the religiously motivated group Boko Haram, internationally known for destroying villages, schools, and kidnapping of children. Nearly every Nigerian state experienced one of the three conflicts as described above, communal, ethnic-religious or as part of the Niger Delta insurgencies. The ACLED data on conflict events support this claim and make visible the different actors involved. As per ACLED specifications each party involved in any type of conflict event, including protests, is labelled as actor.

We show those in Figure 2 for three periods preceding a DHS round: 2003-2007, 2008-2012, and 2013-2017.

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<sup>2</sup> For an overview, see also: <https://www.peaceinsight.org/en/locations/nigeria/?location=nigeria&theme>.

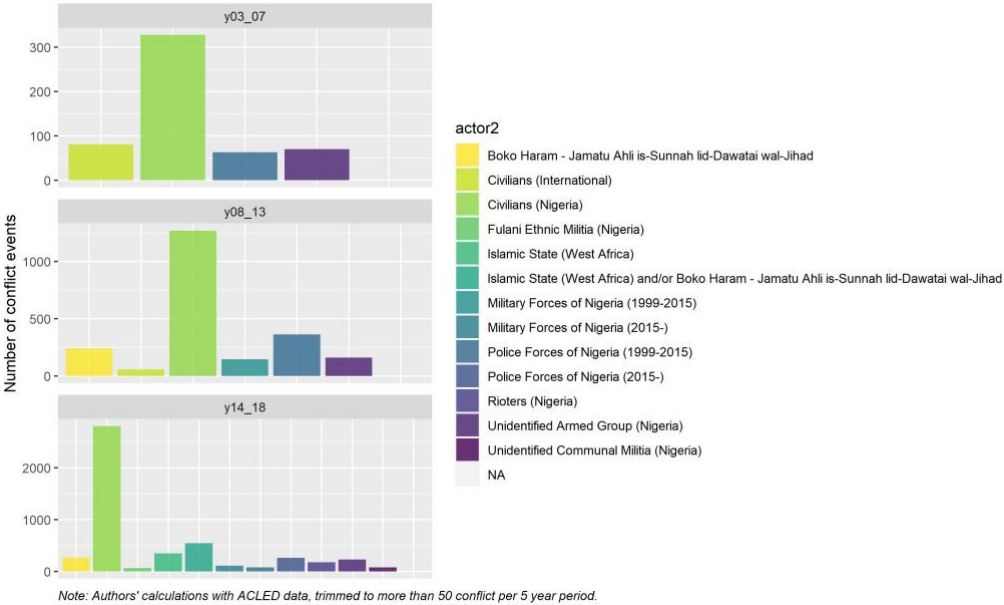
Figure 2: Actors involved according to ACLED (Actor 1)





In the first five-year-interval, conflicts were largely confined to unidentified armed groups (more than 300 instances) and military forces. In the second period, the advent of Boko Haram and the Islamic State together count for almost 1,000 conflict events, while unidentified armed groups accounted for more than 700. Additionally, conflict actors of ‘protesters’ increased substantially from around 130 instances to 550 in the second period. By the third period (2014 – 2018), these increased exponentially to more than 2,000, while conflicts with Boko Haram and Islamic state remained at around 500 in total. As Figure 3 indicates, civilians bore the brunt of many of the conflicts and increasingly so, as they were listed as the second actor more than 300 times in the first period, more than 1,250 times in the second, and almost 3,000 times in the third.

Figure 3: Actors involved according to ACLED (Actor 2)

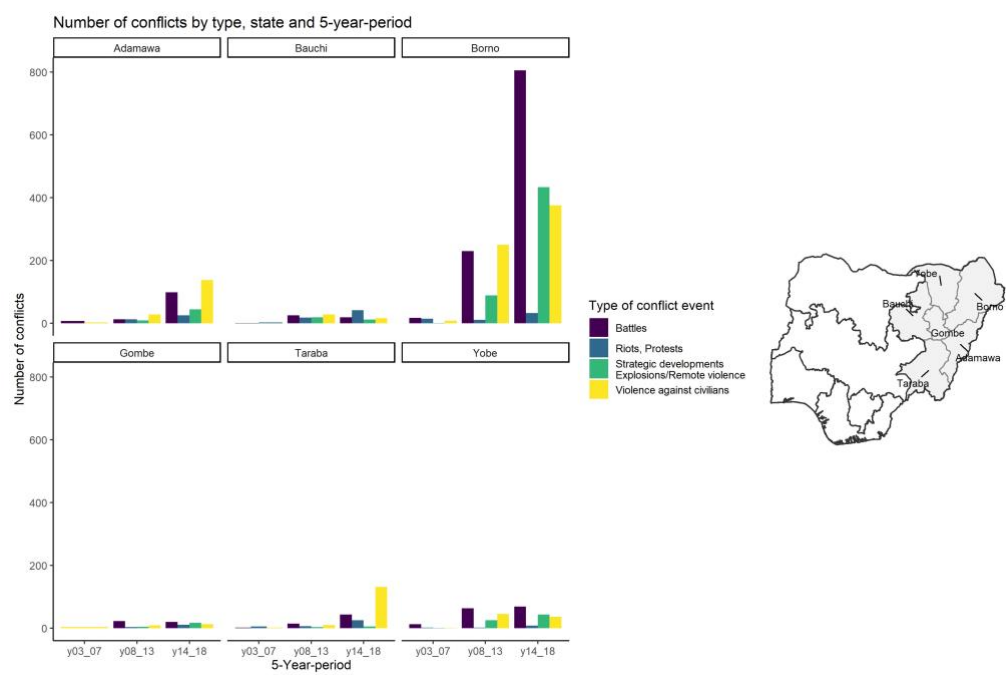


### **4.3 ACLED types of conflict events across states and time**

As described in section 3.4, we use four broad categories of conflict events as coded by the ACLED. They include ‘Battles,’ ‘Riots and Protests,’ ‘Strategic developments, explosions and remote violence,’ and ‘violence against civilians.’ We plot the number of conflict events for each of the four types by state and time 5-year-time period. For illustration, we discuss events in the Northeast and South-South zones of Nigeria (Figures 4 and 5), while the plots for the remaining zones can be found in the Appendix (Figures B.1 to B.4).

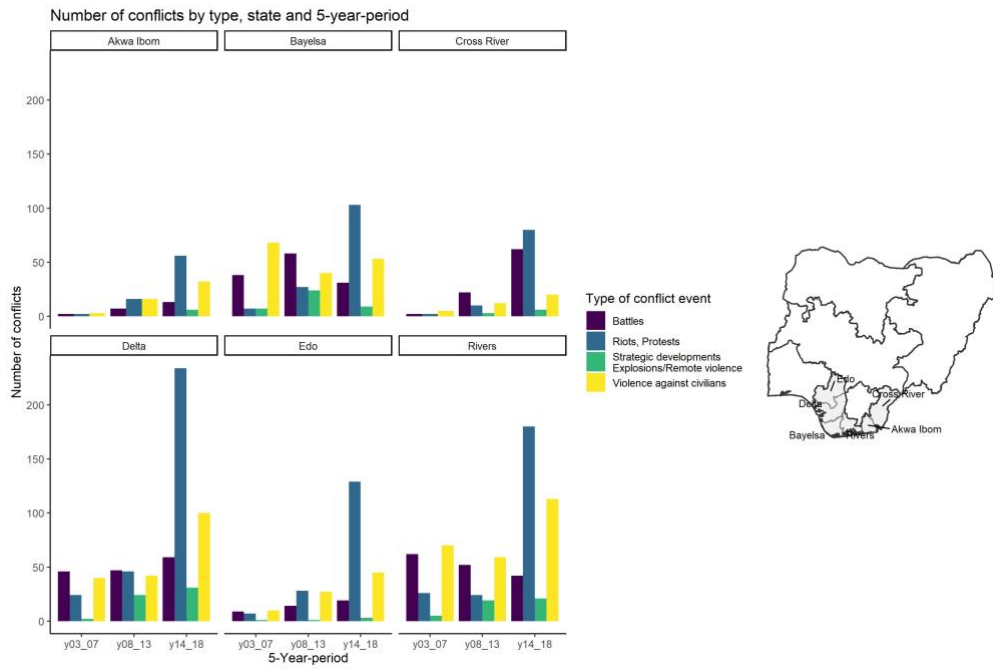
The plots show how four types of conflicts vary in magnitude across states and time. For the Northeast, Borno state stands out. The disproportionately high number of for violent attacks against civilians (by Boko Haram) and battles with government forces are shown Figure 4. This is particularly so for the second period (2008-2013), and even higher levels for the third period, expanding the scale and magnitude of the y-axis. Relatively speaking, other states within the Northeast seem to be affected less, yet violence against civilians rose also in the states of Adamawa and Taraba.

**Figure 4:** Conflict events by state and type: North East



In the Southern states of the ‘South South’, as depicted in Figure 5, the rise in riots and protests is visible across all six states. The toll for civilians increased steadily in all states, especially in Delta state and Rivers state, whereas Bayelsa state saw a constantly and relatively high number of violence against civilians.

**Figure 5: Conflict events by state and type: South South**



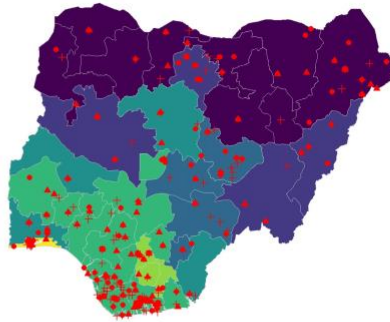
#### **4.4 Trends in poverty and conflict events**

Joining the concurrent changes in conflict events and multidimensional poverty, we plot the geo-locations of the four types of conflict events over state-wise MPI maps in Figure 6. For each DHS year with poverty data, we plot all conflict events that happened in the five years prior and not including the survey year.

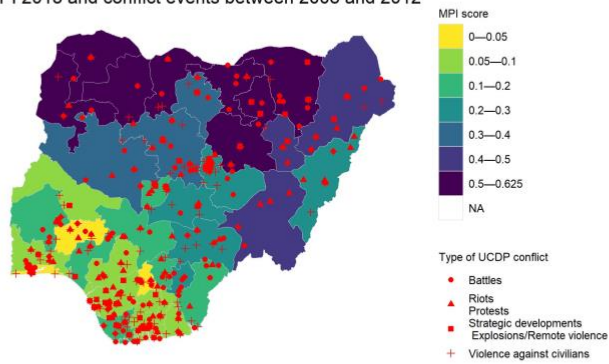
The Northeastern states have traditionally been among the poorest in Nigeria. While they were still by far the poorest in 2018, several states experienced an intermittent period of poverty reduction between 2008 and 2013. During the period 2008 and 2012, there was not evident rise in conflict events. This however occurred between 2013 and 2017, when the number of events exponentially increased across the North and especially in the Northeast (e.g. Borno state). Southern states saw a similar pattern. By far the least poor states and with much progress in MPI reduction between 2008 and 2013, progress towards 2018 was mixed. Conflict events slightly increased from the first to the second period, and then escalated in third period, with all Southern states covered by conflicts events. Both the locations and the number of conflict events change over time. Among the wealthiest region, the number of all types of conflict events in the Delta state have increased over time as well. This shows that a) conflict events may increase in both poor and rich states and b) could potentially halt or reverse progress in poverty reduction.

**Figure 6:** Dynamics of conflict events and multidimensional poverty

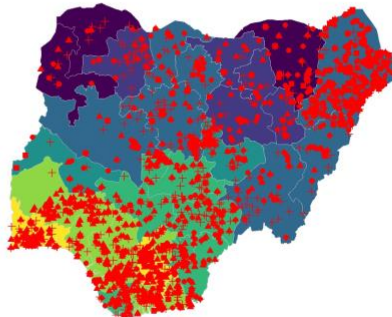
MPI 2008 and conflict events between 2003 and 2007



MPI 2013 and conflict events between 2008 and 2012



MPI 2018 and conflict events between 2013 and 2017



Notes: Calculated by authors using data computed from Alkire et al (2020) based on Nigeria Demographic and Health Survey 2013 and 2018. The underlying shp-file from the Demographic and Health Surveys Program (2020). Conflict data are from the Uppsala Conflict Data Programme (UCDP).



## 5 The poverty-conflict nexus: toward quantifying the relationship

Using the unique DHS-ACLED regional panel data, and adopting a people-centered measure of poverty, we examine econometrically whether conflict may have indeed hindered ongoing progress in poverty reduction.

For this, we take a model-based approach to measure the association between MPI levels by state ( $y$ ) and the contemporaneous number of conflict events ( $C$ ), controlling for state fixed effects ( $u$ ). We explore different model specifications to estimate the strength and direction of the association between MPI and conflict events and establish robustness of our results.

Model 1 represents the simplest specification, and takes the following form:

$$y_{it} = \beta_0 + \beta_1 C_{it} + u_i + e_{it} \quad (1)$$

where  $i$  denotes a state and  $t$  denotes a time period. Thus  $e_{it}$  is the idiosyncratic error associated to state  $i$  at time  $t$ .

Model 2 aims at making subnational heterogeneities more visible by including regional indicator variables,  $R_{ir}$ , interacted with the state-level number of conflict events.  $R_{ir}$  takes a unity value if state  $i$  is in region  $r$ , where  $r$  may denote Northeast, North West, South East, South South or South West. The North Central region is taken as the reference without loss of generality, and state fixed effects are included:

$$y_{it} = \beta_0 + \beta_1 C_{it} + \sum_{r=1}^6 \beta_{2,r} (C_{it} \times R_{ir}) + u_i + e_{it} \quad (2)$$

Model 3 complements the previous model by including time effects ( $\lambda$ ):

$$y_{it} = \beta_0 + \beta_1 C_{it} + \sum_{r=1}^6 \beta_{2,r} (C_{it} \times R_{ir}) + \lambda_t + u_i + e_{it} \quad (3)$$

Model 4 further includes the state-level economic revenue ( $X$ ) as an additional variable to control for general economic conditions:

$$y_{it} = \beta_0 + \beta_1 C_{it} + \sum_{r=1}^6 \beta_{2,r} (C_{it} \times R_{ir}) + \beta_3 X_{it} + \lambda_t + u_i + e_{it} \quad (4)$$

The estimation results of these four model specifications for each type of conflict event are presented in Tables [A.2](#) (Battles), [A.3](#) (Strategic developments or explosion/remote violence), [A.4](#) (Riots and protests), [A.5](#) (Violence against civilians).

One result that we wish to highlight, and that is largely robust across model specifications, is that conflict events are more prevalent in states with *lower* MPI levels. This is inferred by the consistently negative and significant coefficients directly associated with each conflict variable in all models. This result is aligned with [Verwimp et al. \(2018\)](#) who stress that understanding conflict as problem of poverty and of the poor is not entirely accurate.

We also detect marked regional heterogeneities around the general negative association between conflict events and MPI levels. Although this relationship is valid for the country as a whole, it is particularly true in the North Central and Northeast regions, which is consistent with the description presented in previous sections. This regional heterogeneity can be more easily seen in Appendix Tables [A.6](#) through [A.9](#) presenting the estimated marginal effects of each conflict event on the MPI value.

Moreover, we show further empirical evidence for the fact that the association that we describe is, overall, more prevalent in states that managed to reduce multidimensional poverty in 2008-2013. This is supported by the estimation results of a fifth model

specification that includes an additional regressor indicator variable signaling those states where MPI was reduced in that time span, interacted with the number of conflict events:

$$y_{it} = \beta_0 + \beta_1 C_{it} + \sum_{r=2}^6 \beta_{2,r} (C_{it} \times R_{ir}) + \beta_3 X_{it} + \beta_4 (C_{it} \times \mathbb{1}(M_{0,i2013} - M_{0,i2008} < 0)) + \lambda_t + u_i + e_{it} \quad (5)$$

Without claiming causality, the significant negative sign of the coefficient associated to the newly introduced interaction term presented in Tables [A.2](#), [A.3](#), [A.4](#), and [A.5](#) (model 5) provides evidence suggesting that conflict may have, indeed, halted processes of poverty reduction in Nigeria. To put this in context, the number of multidimensional poor people in Nigeria has *increased* from 88 million to 91 million between 2013 and 2018 ([Jennings and Oldiges, 2020](#)). Thus, while we cannot claim causality, conflict events may not only have stopped the improvements seen for the period of 2008 to 2013 but could have reversed these trends. To provide further evidence for this claim, let us recall Figure [6](#). Evidently, the far central-eastern state of Adamawa saw a significant MPI reduction between 2008 and 2013. The MPI score reduced from 0.47 to 0.28 (also see Table [A.1](#)), while conflict events in between 2008 and 2012 were sporadic. Yet, the next period between 2013 and 2017 saw a deterioration in poverty reduction, as the MPI score did not decrease further but rose to 0.33. At the same time, conflict events picked up drastically as well. We concur that it may be this concurrence along with similar associations visible in other states such as Niger, Gombe, and Kebbi that our regression models pick up.

## 6 Discussion of Results and Concluding Remarks

In our study, we address the endogenous relationship between a rising number of diverse conflict events and changes in multidimensional poverty over time. Guided by the overall

question how conflict affects levels of poverty and trends in poverty, we are also interested in whether conflict is more likely to occur in poor areas to begin with. With a state-panel of 37 Nigerian regions, we combine multidimensional poverty estimates for three survey periods in 2008, 2013, and 2018 with the number of conflict events witnessed five years prior to each survey.

First and foremost, we find that conflict in Nigeria tends to occur and increase in terms of the number of conflict events in relatively less-wealthy states, particularly so in states of the Northeast and North Central regions. However, we show that conflict events have also increased in wealthier states, and interestingly so also in states that had seen a previous reduction in multidimensional poverty. In other words, states with previous records of poverty alleviation saw an increase in conflict events over time. Without claiming causality, there is evidence for conflict stopping the trends of poverty reduction across Nigeria. In several states, conflict may have actually contributed to the rise in multidimensional poverty.

The associations that we detect go beyond internal political borders. To probe this further and set grounds for subsequent research on this matter, we fit a fixed effects spatial regression of the following form:

$$y_{it} = \beta_0 + \beta_1 C_{it} + \beta_2 [WC_t]_i + u_i + e_{it} \quad (6)$$

where  $W$  denotes the spatial weights matrix for all states. The generic element  $W_{a,b}$  specifies the magnitude of the ‘spillover’ association between conflict in state  $b$  and MPI levels in state  $a$ . In this exploratory analysis, we posit a contiguous spatial dependence with  $W$  containing non-zero elements only if regions  $a$  and  $b$  are immediate state neighbors. All other elements in  $W$ , including those in the main diagonal are zero-valued.

The estimation results of this model can be found in Table 1. Irrespective of type of conflict event, we find that the *indirect* (i.e., spatial spillover) association between conflict and level of MPI is at least as strong as - and often larger than the direct one. This means that conflict events are more frequent in Nigerian states that have lower MPI levels *or are next to* states with relatively lower MPI levels. This means that conflicts tend to occur in ‘clusters’ of relatively less poor Nigerian states.

**Table 1:** Spatial spillover effects of conflict on MPI (panel setting)

| Association                      | Type of Conflict Event |     |         |     |         |     |         |     |
|----------------------------------|------------------------|-----|---------|-----|---------|-----|---------|-----|
|                                  | Type 1                 |     | Type 2  |     | Type 3  |     | Type 4  |     |
| Direct                           | -0.0012                | *** | -0.0018 | *** | -0.0004 |     | -0.0011 | *** |
| Indirect                         | -0.0023                | *** | -0.0028 | **  | -0.0022 | *** | -0.0013 | **  |
| Total                            | -0.0034                | *** | -0.0046 | *** | -0.0026 | *** | -0.0024 | *** |
| * p<0.05, ** p<0.01, *** p<0.001 |                        |     |         |     |         |     |         |     |

Our findings on these spatial spillover effects reinforce the call by [Davis](#) elsewhere in this Special Issue for greater attention to the (shifting) territoriality of conflict within the international borders of a country. They also echo observations by [Idler and Tkacova](#) in this Special Issue. They visualize dynamically changing conflict shapes based on Boko Haram-related conflict events in Northern Nigeria. As shown in Figure 6 of their article, these have shifted across several Nigerian state boundaries and further inland. Thus, while conflict events were mostly concentrated and originated in the poorest (Northern) states, wealthier ones were eventually affected over time via spatial spillovers. In other words, the lives of both the poor and better-off are affected.

The spatial spillovers being at least as large as the direct associations between poverty and the experience of conflict may reflect a need for inter-state coordination to prevent conflict. From a policy perspective, there is a need to avoid thinking of conflict borders as impermeable barriers. Our analysis shows that the social, economic, and political tissues are responsive to conflict irrespective of the existence of a political border. Keeping such spillovers in mind, may help prevent conflict outburst in regions that are vulnerable due to their geographical proximity to conflict-prone areas as well. Furthermore, and related to the work by [Rugo](#) in this Special Issue on how the arts help understand experiences of conflict, our analysis shows that by focusing on the lived ‘experience of poverty’ via the many forms of poverty over time, we can get closer to conceptualizing how people experience different conflict events. This in turn may not only help prevent further conflicts but may also guide policies on recovery and rebuilding of societies and improving people’s quality-of-life in the aftermath of conflict events.

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## A Tables

**Table A.1:** Multidimensional poverty by year and state

| Region        |             | MPI  |      |      | H     |       |       | A     |       |       |
|---------------|-------------|------|------|------|-------|-------|-------|-------|-------|-------|
| Zone          | State       | 2008 | 2013 | 2018 | 2008  | 2013  | 2018  | 2008  | 2013  | 2018  |
| South East    | Abia        | 0.08 | 0.07 | 0.04 | 18.71 | 17.23 | 9.33  | 43.61 | 42.12 | 38.02 |
| North East    | Adamawa     | 0.47 | 0.28 | 0.33 | 79.81 | 56.81 | 62.52 | 58.58 | 48.77 | 53.24 |
| South South   | Akwa Ibom   | 0.13 | 0.10 | 0.09 | 30.43 | 22.77 | 20.80 | 43.30 | 42.03 | 41.11 |
| South East    | Anambra     | 0.05 | 0.04 | 0.03 | 13.42 | 9.72  | 8.60  | 40.02 | 44.29 | 40.30 |
| North East    | Bauchi      | 0.59 | 0.56 | 0.45 | 90.30 | 85.16 | 74.80 | 64.84 | 65.67 | 60.33 |
| South South   | Bayelsa     | 0.19 | 0.11 | 0.12 | 43.24 | 25.79 | 28.48 | 44.32 | 40.76 | 41.23 |
| North Central | Benue       | 0.36 | 0.26 | 0.17 | 70.54 | 55.31 | 37.17 | 50.57 | 46.83 | 45.17 |
| North East    | Borno       | 0.57 | 0.41 | 0.34 | 88.01 | 71.64 | 61.14 | 64.93 | 56.60 | 56.01 |
| South South   | Cross River | 0.22 | 0.15 | 0.12 | 48.44 | 34.65 | 29.03 | 44.88 | 42.93 | 41.42 |
| South South   | Delta       | 0.12 | 0.09 | 0.08 | 27.26 | 22.69 | 20.25 | 45.53 | 41.66 | 37.83 |
| South East    | Ebonyi      | 0.31 | 0.21 | 0.19 | 57.33 | 45.51 | 45.89 | 53.82 | 46.62 | 42.18 |
| South South   | Edo         | 0.12 | 0.07 | 0.09 | 28.35 | 16.90 | 21.39 | 43.40 | 41.22 | 42.06 |
| South West    | Ekiti       | 0.13 | 0.04 | 0.09 | 30.96 | 10.33 | 21.82 | 43.58 | 37.20 | 39.83 |
| South East    | Enugu       | 0.15 | 0.10 | 0.09 | 33.34 | 24.72 | 21.74 | 45.50 | 42.43 | 40.09 |
| North Central | FCT Abuja   | 0.13 | 0.10 | 0.12 | 27.71 | 22.94 | 27.17 | 47.53 | 45.04 | 43.82 |
| North East    | Gombe       | 0.50 | 0.45 | 0.48 | 83.60 | 76.53 | 80.36 | 60.31 | 58.89 | 60.35 |
| South East    | Imo         | 0.10 | 0.07 | 0.05 | 24.62 | 16.69 | 12.30 | 39.40 | 41.27 | 39.82 |
| North West    | Jigawa      | 0.58 | 0.53 | 0.49 | 93.78 | 88.69 | 86.64 | 62.30 | 59.50 | 56.90 |
| North West    | Kaduna      | 0.27 | 0.31 | 0.31 | 52.47 | 57.16 | 55.71 | 50.61 | 54.36 | 55.30 |
| North West    | Kano        | 0.42 | 0.38 | 0.37 | 75.34 | 70.60 | 69.38 | 55.77 | 54.49 | 53.16 |
| North West    | Katsina     | 0.53 | 0.51 | 0.40 | 87.14 | 82.42 | 71.92 | 61.25 | 62.10 | 55.33 |
| North West    | Kebbi       | 0.53 | 0.53 | 0.59 | 86.50 | 84.56 | 87.36 | 61.46 | 62.63 | 67.00 |
| North Central | Kogi        | 0.17 | 0.10 | 0.15 | 37.03 | 23.28 | 32.52 | 45.69 | 43.14 | 45.53 |
| North Central | Kwara       | 0.29 | 0.10 | 0.21 | 51.13 | 23.82 | 38.12 | 55.77 | 41.89 | 55.01 |
| South West    | Lagos       | 0.04 | 0.02 | 0.02 | 8.64  | 5.04  | 4.14  | 43.64 | 40.86 | 38.94 |

|               |          |      |      |      |       |       |       |       |       |       |
|---------------|----------|------|------|------|-------|-------|-------|-------|-------|-------|
| North Central | Nasarawa | 0.32 | 0.25 | 0.16 | 64.64 | 50.76 | 35.02 | 49.29 | 48.28 | 45.89 |
| North Central | Niger    | 0.50 | 0.32 | 0.38 | 78.91 | 61.37 | 66.60 | 62.95 | 52.80 | 56.83 |
| South West    | Ogun     | 0.21 | 0.10 | 0.05 | 42.22 | 23.01 | 11.33 | 49.64 | 43.01 | 43.24 |
| South West    | Ondo     | 0.17 | 0.12 | 0.09 | 36.53 | 27.00 | 22.06 | 46.83 | 44.33 | 39.36 |
| South West    | Osun     | 0.12 | 0.04 | 0.08 | 27.25 | 10.91 | 20.33 | 43.66 | 38.16 | 41.68 |
| South West    | Oyo      | 0.19 | 0.14 | 0.08 | 36.87 | 26.54 | 17.67 | 52.14 | 52.93 | 47.95 |
| North Central | Plateau  | 0.38 | 0.29 | 0.26 | 75.58 | 56.84 | 52.64 | 49.91 | 51.55 | 48.52 |
| South South   | Rivers   | 0.13 | 0.08 | 0.06 | 26.08 | 18.72 | 14.87 | 47.99 | 41.23 | 37.89 |
| North West    | Sokoto   | 0.56 | 0.53 | 0.55 | 89.20 | 84.15 | 87.71 | 62.95 | 62.77 | 63.25 |
| North East    | Taraba   | 0.44 | 0.42 | 0.37 | 77.86 | 75.07 | 70.07 | 56.85 | 56.36 | 52.62 |
| North East    | Yobe     | 0.58 | 0.61 | 0.54 | 90.28 | 88.97 | 82.43 | 64.08 | 68.90 | 65.51 |
| North West    | Zamfara  | 0.60 | 0.59 | 0.48 | 89.28 | 90.29 | 76.14 | 67.64 | 65.30 | 62.57 |

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Authors' calculations based on DHS data from 2008, 2013, and 2018.

|                         | Model 1              | Model 2              | Model 3              | Model 4              | Model 5             |
|-------------------------|----------------------|----------------------|----------------------|----------------------|---------------------|
| Conf. 1                 | -0.001***<br>(0.000) | -0.007***<br>(0.001) | -0.005***<br>(0.001) | -0.004***<br>(0.001) | 0.002<br>(0.001)    |
| North Central # Conf. 1 |                      | 0<br>(.)             | 0<br>(.)             | 0<br>(.)             | 0<br>(.)            |
| North East # Conf. 1    |                      | 0.006***<br>(0.001)  | 0.004***<br>(0.001)  | 0.004***<br>(0.001)  | 0.003***<br>(0.001) |
| North West # Conf. 1    |                      | 0.006*<br>(0.002)    | 0.005*<br>(0.002)    | 0.005<br>(0.003)     | 0.002<br>(0.002)    |
| South East # Conf. 1    |                      | 0.001                | 0.006*               | 0.006                | 0.007               |

|                               |          |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|----------|
|                               |          | (0.003)  | (0.002)  | (0.004)  | (0.004)  |
| South South # Conf. 1         |          | 0.009*** | 0.005*** | 0.005*** | 0.005*** |
|                               |          | (0.002)  | (0.001)  | (0.001)  | (0.001)  |
| South West # Conf. 1          |          | -0.014   | -0.002   | -0.009   | -0.008   |
|                               |          | (0.007)  | (0.008)  | (0.010)  | (0.010)  |
| Reduced MPI 2008/13 # Conf. 1 |          |          |          |          | -        |
|                               |          |          |          |          | 0.007*** |
|                               |          |          |          |          | (0.001)  |
| Time effects                  |          |          | Yes      | Yes      | Yes      |
| Revenue                       |          |          |          | Yes      | Yes      |
| _cons                         | 0.271*** | 0.284*** | 0.245*** | 0.239*** | 0.238*** |

**Table A.2:** Results Fixed Effects Fit: Conflict Type 1

|           |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|
|           | (0.002) | (0.005) | (0.008) | (0.008) | (0.008) |
| Within R2 | 0.188   | 0.396   | 0.624   | 0.671   | 0.725   |
| Obs.      | 111     | 111     | 111     | 92      | 92      |

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

|                         |           |           |         |          |         |
|-------------------------|-----------|-----------|---------|----------|---------|
|                         | Model 1   | Model 2   | Model 3 | Model 4  | Model 5 |
| Conf. 2                 | -0.002*** | -0.022*** | -0.013* | -0.017** | 0.002   |
|                         | (0.000)   | (0.005)   | (0.005) | (0.005)  | (0.007) |
| North Central # Conf. 2 |           | 0         | 0       | 0        | 0       |

|                                 | (.)      | (.)      | (.)      | (.)      |
|---------------------------------|----------|----------|----------|----------|
| North East # Conf. 2            | 0.020*** | 0.012*   | 0.016**  | 0.015**  |
|                                 | (0.005)  | (0.005)  | (0.005)  | (0.005)  |
| North West # Conf. 2            | 0.014*   | 0.01     | 0.014    | 0.01     |
|                                 | (0.006)  | (0.007)  | (0.007)  | (0.005)  |
| South East # Conf. 2            | 0.012*   | 0.011*   | 0.018**  | 0.018**  |
|                                 | (0.006)  | (0.006)  | (0.005)  | (0.005)  |
| South South # Conf. 2           | 0.025**  | 0.013*   | 0.018**  | 0.017**  |
|                                 | (0.007)  | (0.006)  | (0.006)  | (0.005)  |
| South West # Conf. 2            | 0.005    | 0.011    | 0.009    | 0.01     |
|                                 | (0.013)  | (0.010)  | (0.011)  | (0.010)  |
| Time effects                    |          | Yes      | Yes      | Yes      |
| Revenue                         |          |          | Yes      | Yes      |
| Reduced MPI 2008/13=1 # Conf. 2 |          |          |          | -        |
|                                 |          |          |          | 0.019*** |
|                                 |          |          |          | (0.004)  |
| _cons                           | 0.265*** | 0.272*** | 0.245*** | 0.244*** |
|                                 |          |          |          | 0.239*** |

**Table A.3:** Results Fixed Effects Fit: Conflict type 2

|  |         |         |         |         |         |
|--|---------|---------|---------|---------|---------|
|  | (0.001) | (0.003) | (0.007) | (0.008) | (0.009) |
|--|---------|---------|---------|---------|---------|



|           |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|
| Within R2 | 0.139 | 0.294 | 0.587 | 0.665 | 0.711 |
| Obs.      | 111   | 111   | 111   | 92    | 92    |

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table A.4:** Results Fixed Effects Fit: Conflict type 3

|                         | Model 1           | Model 2            | Model 3             | Model 4             | Model 5           |
|-------------------------|-------------------|--------------------|---------------------|---------------------|-------------------|
| Conf. 3                 | -0.001<br>(0.001) | -0.001<br>(0.001)  | 0.001*<br>(0.000)   | -0.003<br>(0.003)   | -0.001<br>(0.005) |
| North Central # Conf. 3 |                   | 0<br>(.)           | 0<br>(.)            | 0<br>(.)            | 0<br>(.)          |
| North East # Conf. 3    |                   | -0.018*<br>(0.007) | -0.004<br>(0.004)   | -0.004<br>(0.005)   | -0.004<br>(0.005) |
| North West # Conf. 3    |                   | 0<br>(0.003)       | 0.006***<br>(0.001) | 0.008***<br>(0.002) | 0.007<br>(0.005)  |
| South East # Conf. 3    |                   | -0.002<br>(0.001)  | 0.002<br>(0.001)    | 0.004<br>(0.002)    | 0.005<br>(0.002)  |
| South South # Conf. 3   |                   | -0.002<br>(0.001)  | 0.001<br>(0.001)    | 0.004<br>(0.002)    | 0.004<br>(0.002)  |
| South West # Conf. 3    |                   | -0.001<br>(0.001)  | 0<br>(0.001)        | 0.003<br>(0.002)    | 0.003<br>(0.002)  |

|                                 |                     |                     |                     |                     |                     |
|---------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Time effects                    |                     |                     | Yes                 | Yes                 | Yes                 |
| Revenue                         |                     |                     |                     | Yes                 | Yes                 |
| Reduced MPI 2008/13=1 # Conf. 3 |                     |                     |                     |                     | -0.002<br>(0.005)   |
| cons                            | 0.270***<br>(0.006) | 0.280***<br>(0.005) | 0.209***<br>(0.013) | 0.225***<br>(0.017) | 0.227***<br>(0.018) |
| Within R2                       | 0.089               | 0.219               | 0.579               | 0.621               | 0.622               |
| Obs.                            | 111                 | 111                 | 111                 | 92                  | 92                  |

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table A.5:** Results Fixed Effects Fit: Conflict type 4

|                         | Model 1              | Model 2              | Model 3              | Model 4              | Model 5            |
|-------------------------|----------------------|----------------------|----------------------|----------------------|--------------------|
| Conf. 4                 | -0.002***<br>(0.000) | -0.002***<br>(0.000) | -0.001***<br>(0.000) | -0.001***<br>(0.000) | 0.004**<br>(0.001) |
| North Central # Conf. 4 |                      | 0<br>(.)             | 0<br>(.)             | 0<br>(.)             | 0<br>(.)           |
| North East # Conf. 4    |                      | 0<br>(0.000)         | 0<br>(0.000)         | 0<br>(0.001)         | 0<br>(0.001)       |
| North West # Conf. 4    |                      | 0.001<br>(0.001)     | 0.002<br>(0.001)     | 0.002<br>(0.002)     | 0<br>(0.001)       |
| South East # Conf. 4    |                      | -0.005***            | 0.001                | 0.001                | 0.001              |

|                                  |          |          |          |          |          |
|----------------------------------|----------|----------|----------|----------|----------|
|                                  |          | (0.001)  | (0.002)  | (0.003)  | (0.003)  |
| South South # Conf. 4            | 0        | 0.001**  | 0.001*   | 0.001*   |          |
|                                  |          | (0.001)  | (0.000)  | (0.000)  | (0.000)  |
| South West # Conf. 4             | -0.002   | 0.001    | 0.001    | 0.001    |          |
|                                  |          | (0.001)  | (0.001)  | (0.001)  | (0.001)  |
| Time effects                     |          |          | Yes      | Yes      | Yes      |
| Revenue                          |          |          |          | Yes      | Yes      |
| Reduced MPI 2008/13=1 # Conf. 4  |          |          |          |          | -        |
|                                  |          |          |          |          | 0.005*** |
|                                  |          |          |          |          | (0.001)  |
| cons                             | 0.278*** | 0.281*** | 0.238*** | 0.239*** | 0.241*** |
|                                  | (0.002)  | (0.002)  | (0.010)  | (0.013)  | (0.013)  |
| Within R2                        | 0.283    | 0.308    | 0.58     | 0.624    | 0.664    |
| Obs.                             | 111      | 111      | 111      | 92       | 92       |
| * p<0.05, ** p<0.01, *** p<0.001 |          |          |          |          |          |

**Table A.6:** Marginal Effects of Conflict Type 1 on MPI

| From Model 4  |                     |
|---------------|---------------------|
| North Central | -0.004**<br>(0.001) |
| North East    | -0.001**<br>(0.000) |
| North West    | 0.001<br>(0.002)    |
| South East    | 0.001<br>(0.007)    |
| South South   | 0.001<br>(0.001)    |
| South West    | -0.013<br>(0.010)   |

**Table A.7:** Marginal Effects of Conflict Type 2 on MPI

| From Model 4  |                     |
|---------------|---------------------|
| North Central | -0.017**<br>(0.006) |
| North East    | -0.002**<br>(0.000) |
| North West    | -0.004<br>(0.004)   |
| South East    | 0.001<br>(0.007)    |
| South South   | 0.001<br>(0.006)    |
| South West    | -0.008<br>(0.011)   |

**Table A.8:** Marginal Effects of Conflict Type 3 on MPI

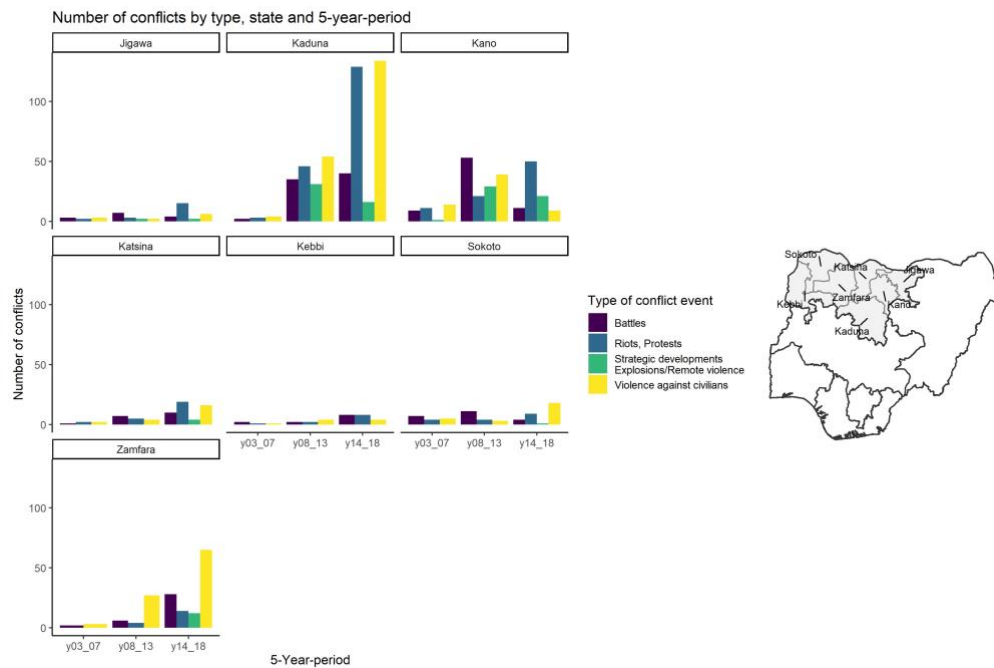
|               | From Model 4      |
|---------------|-------------------|
| North Central | -0.003<br>(0.002) |
| North East    | -0.006<br>(0.006) |
| North West    | 0.005*<br>(0.003) |
| South East    | 0.002<br>(0.002)  |
| South South   | 0.001<br>(0.001)  |
| South West    | 0<br>(0.001)      |

**Table A.9:** Marginal Effects of Conflict Type 4 on MPI

| From Model 4  |                    |
|---------------|--------------------|
| North Central | -0.001*<br>(0.000) |
| North East    | -0.001*<br>(0.001) |
| North West    | 0.001<br>(0.001)   |
| South East    | 0<br>(0.004)       |
| South South   | 0<br>(0.001)       |
| South West    | 0<br>(0.003)       |

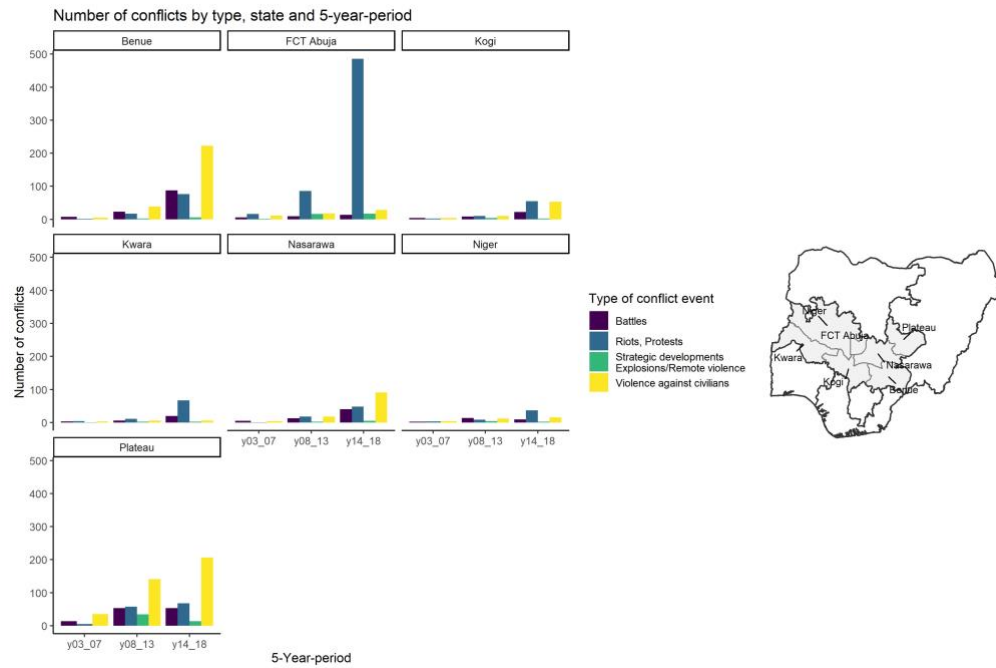
## B Figures

**Figure B.1:** Conflict by state and type: North West

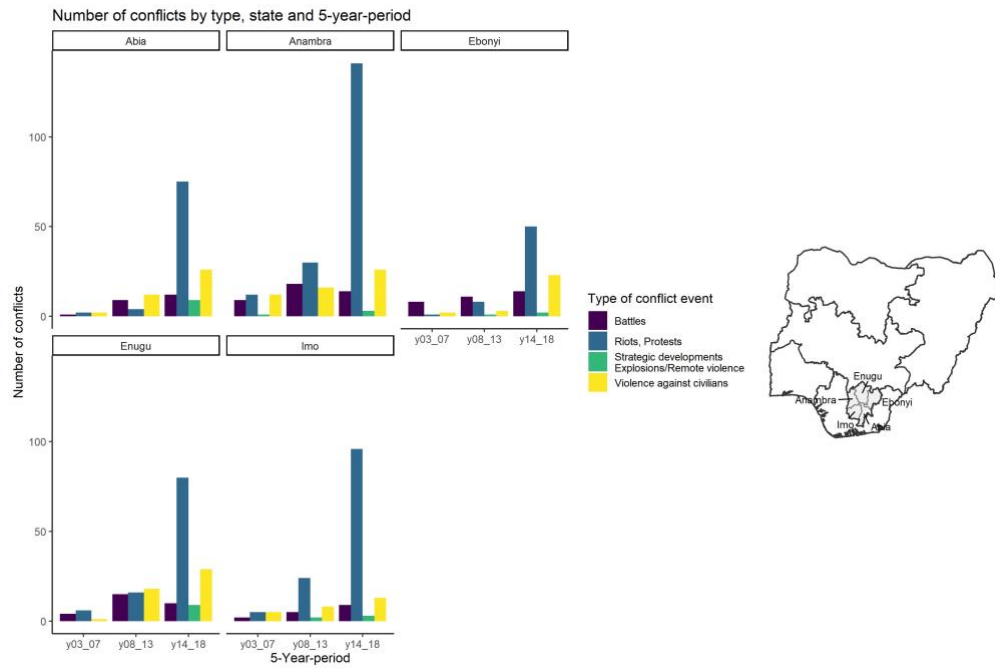




**Figure B.2:** Conflict by state and type: North Central



**Figure B.3: Conflict by state and type: South East**



**Figure B.4: Conflict by state and type: South West**

