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Unpacking the Links between Conflict and Child Welfare: Evidence from a Foreign Insurgency

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Abstract Violent conflicts have enduring effects on child welfare, but little is understood about the mechanisms underlying these effects. Using data from Cameroon collected from a decade be- fore to shortly after the eruption of the Boko Haram insurgency in the country, we study the immediate impacts of terrorist attacks on child welfare. We find that Boko Haram attacks lead to an immediate decrease in weight-for-height for children under five – an indicator of short- term health and nutrition. Furthermore, we find a reduction in health care service utilization which can prolong and aggravate fever and diarrhea. We do not find effects on dietary diversity. Our results are not driven by changes in the sample of children alive, as child mortality is un- affected by the conflict. The results underscore the importance of health care service provision in conflict-affected areas urgently after the eruption of violence to prevent irreversible impacts from taking place.

Key words: Terrorism, Boko Haram, Child health and nutrition, Child labor, Cameroon

JEL Classification: D74, I1, I32, J13, O15

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1 Introduction

Extreme poverty is increasingly concentrated in fragile and conflict-affected countries (Corral et al., 2020). Violent conflict can have an enduring effect on children who grow up during conflict even long after violence. Therefore, breaking the vicious cycle of conflict and child poverty at the onset of violent eruptions could prevent long-term negative consequences from taking place. Yet, evidence on the immediate consequences of violent conflict on children remains scarce due to the difficulty of conducting surveys in newly insecure situations.

This paper examines the immediate consequences of conflict on children to understand how exposure to conflict leads to irreversible adverse child human capital outcomes. Previous literature has shown that children who grow up during conflict are more likely to be stunted, that is, suffer from significantly impaired growth and development in early childhood (Bundervoet et al., 2009; Akresh et al., 2011, 2012b; Minoiu, Camelia and Shemyakina, Olga N , 2012; Minoiu, Camelia and Shemyakina, Olga N, 2014). Stunting, a measure of low Height-for-Age (HAZ), can in turn, lead to a higher prevalence of illnesses, lower wages, and poor educational outcomes in adulthood (Dewey and Begum, 2011). However, stunting cannot be cured; it can only be prevented. To understand how, we investigate the near-term impacts of conflict on child health indicators that affect stunting, namely Weight-for-Height (WHZ), the prevalence of illnesses, their treatment, and child nutrition. Furthermore, literature also shows a deterioration of child human capital of school-aged children (Shemyakina, 2011; Di Maio and Nandi, 2013; Monteiro and Rocha, 2017; Bertoni et al., 2019; Brück et al., 2019). We also explore changing patterns in children's activities at the onset of the conflict to understand the role of children's time use in forming these effects. Our empirical strategy exploits a sudden eruption of terrorist violence and clashes between terrorists and armed forces in Northern Cameroon. The region was unexpectedly affected by the rise of the Boko Haram insurgency that spread across the border from Northeast Nigeria to neighboring Cameroon.

We find that WHZ decreased as a consequence of conflict. The decrease could result from illnesses as well as from the lack of adequate nutrition. We find some evidence showing increased prevalence of diarrhea which may be an immediate consequence of, for example, drinking impure water or digesting low-quality food. We do not find any effects of conflict on fever or cough, common symptoms of malaria. While both fever and diarrhea are highly prevalent among our study sample, the severity of the illnesses may have worsened due to decreased access to health services. Indeed, we find that households were less likely to seek treatment from health care professionals when a child was sick. This decrease may have aggravated the health consequences of the observed illnesses. Evidence from both Cameroon and Nigeria shows that insurgents have destroyed and damaged health care centers (International Crisis Group, 2017a), thus deteriorating their operational capacity. It is also possible that heightened insecurity prevented households from making a safe trip to the nearest hospital or clinic.

A prolonged deterioration of dietary diversity can also have a negative long-run effect on child health. In our study area, dietary diversity among children under three years of age was very low. Children only consumed from two food groups on average, which is well below the threshold of four food groups[1]. We do not find effects of conflict on young child dietary diversity in the near term. We do find, however, changes in the composition of less-often consumed food groups. It is in line with Rockmore (2020) who documents changing patterns in the portfolio of crop and livestock holdings when the risk of conflict increases. While our results show that the nutrition channel was not the first one to respond to conflict, adjacent literature shows that conflict can have a detrimental effect on *household* food security. Adelaja and George (2019) show that the Boko Haram conflict decreased food production in Nigeria, and Justino (2012); Kaila and Azad (2019); Rockmore (2017) show a decrease in household consumption due to conflict, Kaila and Azad (2019) as a consequence of Boko Haram violence. Rising insecurity can decrease the efficiency of food markets, thus limiting access to food, and insurgent attacks against farms can disrupt farming activities and farmers' access to their plots. Our results may indicate that there are substitution effects such that the food intake of children under 36 months of age is prioritized over the food intake of older household members. Furthermore, our research differs from the previous literature in that it analyses the very near-term effects, while the aforementioned studies look at longer time spans. Our results may have thus occurred during a time when households had buffers against food shortages.

Finally, we also investigate whether conflict affected the time use of children between 5 to 17 years of age. We find that children's participation in household tasks increased, accompanied by an increase in school dropout. This finding is in line with results from North-East Nigeria (Bertoni et al., 2019) showing that Boko Haram attacks reduced school enrolment and years of education completed, and generally, with literature that finds adverse schooling and learning outcomes as a consequence of conflict and violence (Shemyakina, 2011; Di Maio and Nandi, 2013; Swee, 2015; Monteiro and Rocha, 2017; Brück et al., 2019). We do not find changes in the prevalence of child labor. Overall, the results indicate a decrease in children's time use outside the household and an increase inside, which could be due to the deteriorated security situation reducing children's mobility outside the household. Indeed the Boko Haram is known for its attacks against schools in Nigeria in the form of large-scale kidnappings of school children. Furthermore, teachers have been threatened and even become victims of violence.

Our paper contributes to the existing literature by conducting a thorough investigation on the immediate pathways through which conflict has irreversible effects on child health. We do so by shedding light on the near-term impacts, finding that conflict immediately deteriorates a child's health status measured by WHZ. Previous literature has documented a strong effect of conflict on child stunting in the context of the war between Eritrea and Ethiopia (Akresh et al., 2012b), the civil war in Burundi (Bundervoet et al., 2009), Rwanda (Akresh et al., 2011), and the Ivory Coast (Minoiu, Camelia and Shemyakina, Olga N , 2012; Minoiu, Camelia and Shemyakina, Olga N, 2014). These studies report the harmful effects of conflict on HAZ and stunting. Height is a

[1] A requirement for minimum dietary diversity is to consume from more than four food groups(UNICEF, 2016)

stock variable that requires persistent harmful disruptions to child development for stunting to take place. Stunted growth is an indicator of irreversible damage to child development. Consequences on height carry huge importance as they can have longer-term consequences to adult health (Akresh et al., 2012a, 2017; Dewey and Begum, 2011). This paper adds new evidence on the immediate impact on child health by examining the effect on WHZ, a measure that can decrease as a consequence of acute food shortages and diseases and fluctuate back to a healthy level. Investigating the impact on WHZ is important from a policy perspective, as the negative effects can be reversed with timely interventions to prevent stunting.

Our second contribution relates to the fact that we can unpack the immediate effects of conflict on various dimensions of child health and well-being that may translate into low WHZ and ultimately to low HAZ. In line with this mechanism, we find an increase in the prevalence of diarrhea. Furthermore, we find evidence on reduced health service utilization, which can aggravate the severity of fever and diarrhea, which are highly prevalent among the under-five children in Northern Cameroon. However, we do not find effects on dietary diversity, which is already low among the study population. Taken together, our results indicate that the reduced treatment of illnesses and an increase in diarrhea may be the immediate mechanisms leading to deteriorating short-term health status measured by WHZ.

Our identification strategy exploits the exposure to an insurgency that originated from outside the borders of Cameroon. The economic and social conditions in Northern Cameroon did not contribute to the emergence of the Boko Haram insurgency, which targets the Nigerian government and society. However, the insurgency has affected areas in Northern Cameroon, particularly where it borders Nigeria. In addition, we control for pre-conflict outcomes by using three nationally representative surveys on child health – one collected in less than a year from the eruption of the first attacks in Northern Cameroon and two surveys collected up to a decade before the conflict, during a long peaceful period in Cameroon. [2] For our data on conflict-related fatalities, we use the geo-coded Armed Conflict Location and Event Data Project (ACLED) database (Raleigh et al., 2010) to identify which households live close to fatal Boko Haram attacks.

Finally, we run multiple checks to assess the validity of our findings. First, conflict may affect child mortality through child casualties, or, through a reduction in maternal health care services, increased child illnesses or malnutrition. If a conflict has affected the mortality of children under five, this implies that the sample of children after the eruption of violence could be systematically different from those before the violence, which could bias our results. We find that conflict does not affect mortality among children under five, including neonatal mortality and infant mortality, that is, death during the first month and first year of life, respectively. Investigating different indicators of child mortality adds to the previous literature: Differentiating between neonatal mortality and mortality indicators after the first month of life is crucial as the former is more often related to health care provision at the time of birth, while the latter is affected by illnesses

[2] The surveys we use are the Multiple Indicator Cluster Survey (MICS) 2014 by UNICEF and the Demographic and Health Surveys (DHS) by USAID collected in 2011 and 2004.

and nutrition in early life.[3] We also run a set of other robustness checks, such as randomized inference and sensitivity checks in the distance radius from the fatalities, which confirm our main findings.

This paper proceeds as follows. In section 2 we discuss the Boko Haram conflict in Cameroon. In section 3 we discuss the conceptual framework, in section 4 we present the data used in the analysis, and in section 5 we present the empirical framework. Section section 6 presents the results, and finally, the last section concludes.

2 The Boko Haram in Cameroon

Boko Haram represents a jihadist ideology that opposes western influence and education in Nigeria. The insurgency aims to establish an Islamic state in Nigeria. While Boko Haram was formed in 2002, the group started attacks against the Nigerian government and civilians in 2009. At the peak of Boko Haram's power in 2013-14, violence also spread across the border to Northern Cameroon, a region bordering northeastern Nigeria, Chad, and Niger in the Lake Chad area. The center of the Boko Haram operations is in Borno state in the North East of Nigeria. Its capital Maiduguri, an urban center at the heart of the conflict and the headquarter of Boko Haram, is situated only 140 km from the Cameroonian border by road. Partly due to this proximity, Cameroon is the most affected foreign nation among the countries in the Lake Chad region. Figure 2a displays how Cameroon is situated within West and Central Africa, and the area inside the square shows Northern Cameroon and illustrates how it borders northeast Nigeria.

The eruption of the Boko Haram violence in 2013-14 was an unprecedented development in Cameroon, as the country has been relatively peaceful since the 1970s. This long period of peace was sustained throughout the democratic transition in 1990. Cameroon has therefore been an exception in the region, given that countries bordering Cameroon – Nigeria, Chad, and the Central African Republic – experienced civil wars and conflict during the recent decades. Figure 1 panel (a) shows that conflict events in Cameroon started in 2013 and peaked in 2014, breaking a long peaceful period in Cameroon. The evolution of the number of fatalities in those incidents closely follows this pattern. Figure 1 panel (b) further shows that the fatalities that occurred in Cameroon since 2013 were in clashes in which Boko Haram was an actor. Most clashes happened between the Cameroonian military forces and the insurgents.

Even though the insurgency does not have political goals with respect to the Cameroonian government, the attacks were similar to those used in Nigeria. They included car bombings, kidnappings, and armed attacks against schools and health centers, disrupting their activities and leaving considerable infrastructural damage. By 2016, it was estimated that 128 out of 793 schools and 30 out of 217 health clinics had been destroyed or damaged in Cameroon (International Crisis Group, 2017a).

[3] A few existing studies investigate child mortality explicitly as an outcome. Akresh et al. (2012b) finds no effects of the Ethiopia-Eritrea conflict on child mortality, while Minoiu, Camelia and Shemyakina, Olga N (2014) finds no systematic differences in sex ratios at birth across regions and over time.

The tactics employed to gain economic power were also similar to those used in Nigeria. The insurgents extorted both farmers in villages and traders along the roads and recruited Cameroonian fighters (International Crisis Group, 2017a). The insurgency gained a foothold in the local informal economy by engaging struggling traders in contraband trafficking, providing them with loans, and using violence and intimidation in enforcing these informal contracts.

Figure 2b displays a map of the Boko Haram attacks as well as the survey clusters of our dataset. We can see that households residing in the Far North region (the northernmost part of Northern Cameroon) and particularly those close to the Nigerian border have been affected by these violent attacks. According to the International Crisis Group (2016), conflict events in the Far North region alone claimed the lives of 1,500 people. In 2018-19, it was estimated that more than 50 percent of households living in the Far North (1.9 million people) needed humanitarian aid, and 222,000 children under five were suffering from acute malnutrition, including 60,000 with severe acute malnutrition (United Nations Office for the Coordination of Humanitarian Affairs (OCHA),, 2019).

The capacity of the Far North to overcome this crisis had been weak from the onset. The Northern region of Cameroon is more sparsely inhabited, more rural, and more impoverished than the rest of Cameroon. In particular, the Far North has been the poorest and least educated region in Cameroon even before the Boko Haram crisis (Yenwong-Fai, 2019). Furthermore, the Far North is weakly integrated into the rest of the country. The weak capacity of the region could have contributed to the severity of its consequences.

The insurgency has created two waves of displacement affecting Cameroon. Nigerians have escaped to the relatively more peaceful Cameroon, and Cameroonians living in the Far North have relocated to the southern parts of the country. Overall, the crisis in Cameroon is estimated to have resulted in 155,000 displacements and 73,000 refugees (International Crisis Group, 2016). However, the movement of Cameroonians in the early stages of the conflict was hampered by the closure of a major North-South road. The road closure also put a strain on the local food production as it prevented much of the trade from taking place (International Crisis Group, 2017a).

3 Conceptual framework

Our conceptual model builds on the health production function by Grossman (1972), which is the analytical point of departure for Maccini and Yang (2009) on illustrating the effect of early life shocks on health. The health production function resulting in a health stock H in time t can then be formulated as

$$H_t = f\left(H_0, N_1, \ldots, N_t, X, C_1, \ldots, C_t, D_1, \ldots D_t\right), \tag{1}$$

where H_0 is the initial health endowment determined by genetic factors at the time of conception. Environmental factors and inputs start affecting the health stock right after conception and throughout life. The history of health inputs (e.g., nutritional intake, and treatment for illnesses) is described by $N_1, \ldots, N_t$, chosen by the caretaker or the individual, while the health stock is also determined by exogenous factors, namely community infrastructure $C_1, \ldots, C_t$ and disease environment $D_1, \ldots, D_t$. We assume f is increasing in H_0, N_t, C_t and decreasing in D_t.

In our application, the Boko Haram insurgency could affect each time-varying factor of health production in multiple ways. First, health inputs may decrease. When economic activities are disrupted by the attacks, this can result in decreased household production or employment. The decreased household income can lead to a lower nutritional intake or a lack of treatment of illnesses. Second, community infrastructure may be destroyed. As noted above, Boko Haram purposefully destroyed or damaged health and education facilities, which could prevent patients from seeking health care services and students from attending school. Even when the facilities are not destroyed, the danger posed by violent conflict could decrease access to the facilities and markets. Third, conflict can also worsen the disease environment if security concerns prevent people from accessing services outside of their household, such as making trips to a protected water source. Finally, the possible interactions between these multiple channels may exacerbate the effect of the conflict. For example, diarrhea can increase due to changes in community infrastructure, such as reduced access to safe drinking water. However, the negative effect of diarrhea on overall health may further be compounded by the reduction in other health inputs, such as the inability to get treatment for the illness.

4 Data

We use three data sources for the empirical analysis: the 2014 Multiple Indicator Cluster Surveys (MICS), Demographic and Health Surveys (DHS) from 2004 and 2011, and Armed Conflict Location and Event Data (ACLED) database. DHS and MICS are nationally representative cross-sectional surveys that provide a range of indicators on child welfare: anthropometric measures, the prevalence of illnesses, healthcare service utilization, nutrition, child labor, and a large number of household-specific information that we use to address the potential omitted variables bias. Moreover, the datasets provide GPS information of the surveyed clusters, which we match with the geo-locations of the conflict events involving Boko Haram using the ACLED dataset. We restrict our sample to Northern Cameroon, which comprises four regions - the Extreme North, North, Adamaoua, and North West - that share borders with North-East Nigeria, where Boko Haram activities have been concentrated. Our sample covers 11,275 children aged 60 months or younger for child health and nutrition results, and their siblings of 5-17 years old for child labor and education, 6,206 individuals.

We measure the health and nutritional status in early childhood using anthropometric measures, WHZ and HAZ, following World Health Organization (WHO) guidelines. These measures are standardized and thus reported as z-scores, with the WHO reference mean being zero for both. Our main variable of interest is WHZ, as weight can fluctuate in the short run due to reasons such as illnesses. That is, it can change as an immediate response to shocks. Height, on the other hand, is a stock variable and is likely to change as a response to persistent changes in nutrition and health. Additionally, by using WHZ and HAZ we construct indicator variables for short-term and long-term malnutrition, namely, wasting and stunting, respectively. We also construct indicators for extreme stunting and wasting, which capture the acute malnutrition.[4] We also investigate the prevalence of fever and cough, and diarrhea in the two weeks preceding the survey date. Severe diarrhea can be associated with, for example, dirty drinking water, and it can affect a child's weight within a short time-period. Fever and cough are major symptoms of malaria. These illnesses can be detrimental for children under five years old, and in worse cases, lead to death when prolonged and untreated.

To understand the mechanism of the immediate effect of conflict on children's nutritional and health status, we investigate a broader set of outcome variables, including healthcare utilization and diversity of nutritional intake. Healthcare service utilization is measured by whether any medical treatment was sought in the case of a child's illness. Nutritional diversity is measured by indicators of intake of different food groups: whether the child had starchy staples, legumes and nuts, meat and eggs, dairy, fruits, or vegetables in the 24 hours prior to the interview. As an aggregate measure of dietary diversity, we construct the number of food groups that the children consumed from, and a dummy variable for having consumed from more than four out of six food groups, an indicator of minimal dietary diversity for this age group (UNICEF, 2016).

Additionally, we examine the effect of conflict on multiple time-use variables for activities both inside and outside the household for a sample of children who are 5 to 17 years old. We investigate child labor, which is defined as participation in economic activities and household chores. We also investigate schooling outcomes, namely i) whether a child attended school in the current school year, ii) whether a child stopped attending school this year (dropout), and iii) whether or not a child has ever studied in school. We use the last variable as a placebo outcome.

To identify conflict-affected households, we use information from the Armed Conflict Location and Event Data (ACLED) database on the dates and geo-locations of events of political violence that occurred in Cameroon from 1997 to 2014. The dataset also provides information on the type of events, whether the events led to any fatalities, and the main actors involved in the event.[5] We use this information to construct our variable of interest on Boko Haram-related fatalities. We include fatalities that occurred in events where Boko Haram was recorded as one of the actors. We exclude riots and protests.[6] After these restrictions, our data includes 728 Boko Haram-related fatal events[7] that occurred during the period between 2004 to 2014 in Cameroon and eastern Nigeria bordering Cameroon with the number of fatalities ranging from 1 to 370. We match this conflict information with the geo-location of surveyed clusters and the interview date to identify which households were exposed. We consider a household been exposed to conflict if it was

[4]Wasting and stunting are defined as two standard deviations below the mean WHZ and HAZ, respectively, while extreme wasting and stunting use the threshold of 3 standard deviations.

[5]Details on how ACLED collects data on political violence from various news sources and how classifications are conducted is available at Armed Conflict Location & Event Data Project (ACLED) (2019).

[6]From Figure 1 we can see that the rise in violence can be attributed to Boko Haram clashing with the Cameroon military in most cases.

[7]We excluded Boko Haram events without fatalities.

located within 20km radius from a Boko Haram-related fatality.[8] We consider the number of fatalities in the last 12 months preceding the survey date as our main variable of interest that measures the intensity of the Boko Haram conflict.

Table 1 presents the mean and standard deviations adjusted with sample weights of control variables (Panel A) and outcome variables (Panel B) for 0-5 years old (Panel B), and outcome variable for the sample of children 5-17 years old (Panel C). We can see that the under-five children sample are 50 percent female, on average 29 months old, and live on average in a household with 8 members. Individuals in households where Christianity is the main religion comprise 50 percent of the sample, while 38 percent are from Muslim households. Sample households are from low socioeconomic status. Educational attainment of mothers is low; just 49 percent of the mothers have received primary or higher education, indicating that more than 50 percent of the mothers had education less than the primary level. The sample is also predominantly rural 73 percent of children living in the rural area.

Children in our sample also show poor nutritional status. Panel B shows that HAZ is -1.42, and WHZ -0.15 on average; that is, both are below the reference mean of zero in the WHO standardization. As many as 34 percent of the children experienced fever or cough and 24 percent diarrhea in 2 weeks prior to the survey. On average, the number of food groups that a child consumed from is 1.92, and only 17 percent of children consumed from more than 4 food groups in the 24 hours prior to the survey. Among this sample, 8 percent have experienced fatal conflict in the 20 km radius.

Children aged 5-17 are often engaged in some kind of work. Looking at Panel C of Table 1 we can see that 55 percent of children had been working in an economic activity outside the household in the 7 days prior to the survey. As many as 77 percent of children are engaged in household tasks, while 62 percent are attending school. Over the last school year, just 1 percent had dropped out, but as many as 34 percent of children have never been to school.[9]

5 Empirical strategy

To analyze the effect of conflict on the immediate child outcomes, we estimate the following linear regression equation:

$$Y_{i,r,w} = \alpha + x'_{i,r,w}\beta + \gamma \text{Fatalities}_{i,r,w} + \delta_{t,m} + \tau_w + \rho_r + \xi_{i,r,w} \tag{2}$$

where $Y_{i,r,w}$ denotes an outcome variable of interest of child i measured in survey wave w in district r. $\text{Fatalities}_{i,w}$ is the main explanatory variable, which denotes the number of fatalities in Boko Haram related conflict events recorded in the ACLED dataset within the 20km radius in

[8] We run a sensitivity check with 40km radius, and the results remain robust to this specification.

[9] We define dropout as children who had attended school in the previous school year, but not in the current (for MICS 2014), and using a direct question on school dropout for the DHS surveys.

the last 12 months preceding the survey date, excluding riots and protests.[10] A similar empirical strategy was used in Brown et al. (2019) in analyzing the effects of community violence in Mexico on individual outcomes using repeated cross-sectional data. A similar research design is also used in Bertoni et al. (2019) who analyze the effects of Boko Haram on educational outcomes, where the authors use 20km as a radius of conflict exposure. We follow this approach and note that this is a somewhat conservative specification as Bertoni et al. (2019) find their effects to be stronger with a smaller radius. We also run sensitivity checks with a wider 40km radius.[11]

The vector $x'_{i,r,w}$ captures child and household control variables: the gender of the child, household size, whether the head of the household is female, a dummy for a rural location, household wealth score, family's religion and ethnicity, mother's age, education level, and marital status.[12]

Children born in different time periods may have been exposed to different conditions in terms of health infrastructure and the state of the economy throughout their life. To control for such covariate changes that affect birth cohorts differently, we add birth-year times birth-month fixed effects denoted by $\delta_{t,m}$. Additionally, we control for survey wave fixed effects τ_w and district fixed effects ρ_r, that is, fixed effects at the level of the sub-regional administrative unit. Standard errors are clustered at the district level across all specifications.

6 Results

This section presents the results on the effects of fatalities in Boko Haram attacks on child outcomes. In Tables 2 - 5, Panel A and B display the regression results with and without control variables, respectively.

6.1 Effects on nutritional status

We find that Boko Haram attacks hurt the short-term nutritional status of under-five children: conflict-related fatalities decrease WHZ and increase the probability of being extremely wasted. These results on anthropometry are presented in Table 2. Column (2) of Panel A shows that an additional conflict-related fatality decreases the WHZ by 0.001 standard deviations, and this result is statistically significant at 5 percent level. Some of these effects may be concentrated at the lower end of the WHZ distribution. We can see that an additional fatality leads to a 0.02 percentage point increase in the propensity to be extremely wasted, although this effect is estimated with a borderline statistical significance of 10 percent. Both of these estimates are robust to the exclusion of control variables (Panel B). The propensity to be wasted is not affected substantially, indicated

[10] The 12-month threshold is not a limiting factor to the conflict variable, as the first Boko Haram attack in Cameroon happened in 2013. That is, increasing the recall period would have little effect on the conflict variable. Furthermore, prior to 2013 Cameroon had a very long period of security and lack of any type of conflict, as illustrated in Figure 1.

[11] Our model is similar to Bertoni et al. (2019) also in the sense that they consider a school year as a period of interest, a similar time-interval to our specification.

[12] Wealth index is readily constructed in the DHS and MICS datasets using principal component analysis (PCA), as using household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities as variables entering the PCA. A detailed description of the DHS methodology can be found at `https://dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm`

by the statistically insignificant coefficients (Column (4) in Panel A and Panel B).

To better contextualize the effects, we also present the coefficient and the p-value of the average effect, which we calculate by multiplying the number of average fatalities and the estimated coefficients. These estimates are presented at the bottom of each panel. The average effects on short-term nutritional status are substantial: On average, the WHZ score decreases by 0.12 standard deviations. Given that the average child has a lower WHZ score than the WHO reference mean of zero, this decrease is alarming for those children with already low WHZ. The propensity to be extremely wasted increases by 1.5 percentage points, a sizable 50 percent increase considering that 2.8 percent of under-five children are extremely wasted. While the effect is measured at a low significance level, the result is problematic as it suggests potential extreme malnutrition due to conflict.

On the other hand, HAZ, a measure of long-term nutritional status does not change in response to fatalities. Estimated effects for HAZ (Column (1)), the propensity to be stunted (Column (3)), and extremely stunted (Column (5)) are not statistically significant, as expected. Height is a stock variable that does not fluctuate due to sudden shocks but rather takes a longer time to change as a response to persistent changes in nutrition or prolonged illnesses. That is, we do not expect to see changes in HAZ for the short time interval of our study. In fact, this result can be considered as a placebo-check, and the null result is as expected.

Taken together, the results on WHZ are worrying in and of themselves, but also considering the low HAZ score. The average HAZ being -1.42 is not far from the threshold of stunting, -2 (Table 1). This implies that children suffered from the causes of low cumulative nutritional status throughout their life. The immediate effects of conflict and other sudden shocks can accumulate over time, further decreasing HAZ.

Finally, there may be measurement errors on both our anthropometric indicators and the conflict fatalities. Given that ACLED uses information collected from newspaper sources, the fatalities we observe may be undercounted if we expect some conflict-related fatalities not to have been reported in newspapers and other public sources used by ACLED. This would result in attenuation bias. Similarly, we expect attenuation bias in our results on HAZ, given the issues in misreporting of child age in surveys when birth records are not available for the enumerators. While this issue does not concern our main variable of interest, the WHZ, we acknowledge that such non-classical measurement error may be present in our HAZ results (**?**Larsen et al., 2019).[13]

6.2 Effects on illnesses and access to treatment

We find some evidence on the increase in the prevalence of illnesses and strong evidence pointing to lower use of health care services when a child falls ill. The results are shown in Table 3.

[13]We do not expect the measurement errors on anthropometry and conflict fatalities to be correlated, given that the data come from different sources. We are wary that measurement error in controls and outcome variables may be correlated given that the data sources are the same DHS and MICS surveys, and this can have implications for the sign and size of the bias (Abay et al., 2019). This concern highlights the importance of reporting results both with and without controls throughout the paper.

Columns (1) and (3) in Panel A of Table 3 show that the conflict-related fatalities increase the probability of a child having had diarrhea by 3 percentage points on average. However, this effect is significant only at the 10 percent level. Considering that 24 percent of children had diarrhea in the two weeks preceding the survey, the related increases amount to a 12.5 percent increase from the average. The coefficient estimates on fever or cough are positive, but the effects are not statistically significant. Taken together, the increase in the prevalence of diarrhea may be one channel through which conflict negatively impacts child health status as measured by anthropometry.

The effect of illnesses on longer-term health outcomes can be mitigated if children receive appropriate and timely treatment from formal healthcare providers. Untreated and prolonged diarrhea and fever, especially when fever is a symptom of malaria, can be dangerous in the short term and ultimately lead to long-term adverse outcomes. Therefore, we also examine whether illnesses went untreated more often, conditional on occurring. Columns (2) and (4) of Table 3 Panel A show that an additional fatality decreases the likelihood of taking a child with fever or cough to any health care provider by 0.06 percentage points, and with diarrhea by 0.05 percentage points. On average, these effects translate to a decrease of 5 percentage points and 4 percentage points, respectively, and both coefficients are statistically significant at the 1 percent level. Almost a half of the cases of either illness result in caretakers not seeking medical assistance. Our results thus translate into a 10 and 8 percent reduction in seeking assistance for fever or cough and diarrhea, respectively.

One of the reasons why seeking treatment has become more uncommon likely relates to the reduction in the supply of health care. Boko Haram has conducted attacks against health facilities in Cameroon (International Crisis Group, 2017a)[14]. Another potential reason could be the widespread insecurity, regardless of the operational status of the nearby health care facilities.

We further investigate whether there has been a change in the composition of health care providers used to see if the results may be driven disproportionately by formal health facilities. The estimates presented in Table A4 show results for the use of formal, informal, and traditional care providers, *conditional* on seeking help. We find that none of the results are statistically significant; that is, we do not find changes in the composition of the type of care used. We do find a reduction in traditional care, which is significant at the 10 percent level. Still, this decrease is not accompanied by an increase in any of the other categories, implying little evidence on compositional changes in the type of health care providers used.

Taken together with the estimates presented in Table 3, our results point to obstacles in connecting with health care providers in general. It may be that the reduced security situation has prevented households from seeking care from all kinds of providers or that all providers have faced obstacles in providing services. Furthermore, our results on the prevalence of illnesses and their treatment show that while diarrhea has become more prevalent, there are also obstacles in reaching health care providers or receiving care. It may aggravate the consequences of these ill-

[14]This is not an uncommon strategy for Boko Haram, as health facilities have been a frequent target of insurgent attacks in North-East of Nigeria (Obi, Felix Abrahams and Eboreime, Ejemai, 2017).

nesses; for example, malaria can be life-threatening if left untreated. In general, untreated diseases can result in loss of weight and can have severe long-term consequences for child health.

6.3 Effects on nutritional intake

Next, we analyze whether conflict-related fatalities affect the food intake of children aged 0-36 months. We do not find changes in dietary diversity as a consequence of conflict. Results are shown in Table 4, and we can see that there is no detectable change in the number of food groups or in the prevalence of consuming more than four out of six food groups, an indicator of minimal dietary diversity for children under three years old ((Columns (1) and (2)). On average, children only consumed from two food groups in the last seven days preceding the survey.

In columns (3) to (8), we show the results per food group. Each dependent variable is a dummy denoting whether the child had consumed anything from this food group, that is, the effect at the extensive margin. Starchy staples are the food group that children most often consumed (70 percent of children had consumed this group), followed by vegetables (39 percent of children). We do not see statistically significant changes in having consumed from these two most prevalent food groups. However, we find compositional changes among the less-consumed food groups. The consumption of legumes and nuts decreased at an extensive margin, and the coefficient is statistically significant at the 5 percent level. However, only 22 percent of children consumed this food group. We also find an increase in the prevalence of having consumed dairy, which is on average consumed by just 14 percent of children. Many children in this age range are breastfed, so this effect may be a substitution effect as a result of decreased breastfeeding.[15] This could happen if the mother's time use with children changes due to the conflict. We also observe a slight increase in the consumption of fruits, but this effect is significant at 10 percent level.

Taken together, we do not find a reduction in dietary diversity as a consequence of conflict. It is important to point out that dietary diversity is already very low, with the average child only consuming from two food groups. Furthermore, these extensive margin effects may mask any effects in the *quantities* consumed. The compositional changes may reflect the fact that farming households may change both their livestock as well as crop portfolio in the face of conflict risk (Rockmore, 2020). Therefore, in conflict situations where farming activity is not entirely disrupted, the dietary diversity of small children may not change as households move from profit-maximizing to risk-mitigating farming strategies and maintain a certain level of food production.

The evidence presented so far points to a situation where the prevalence of illnesses and their treatment are immediately affected as a consequence of conflict, while there are no large changes in dietary diversity.

[15] We are unable to investigate this as we do not have repeated cross-sectional information on breastfeeding in our data.

6.4 Heterogeneity by age

Next, we investigate whether the observed impacts in anthropometry, illnesses and health care utilization vary across age groups among the under-five children. We divide our sample into younger children aged between 0 and 36 months and older children aged from 37 to 60 months. Children grow faster when they are younger and at a relatively steady pace after turning two years old. Therefore, changes in anthropometric measures of younger children may be easier to detect statistically. On the other hand, this group may be less susceptible to changes in their living environment. Children below two years of age are often breastfed, and babies under six months are exclusively breastfed, which may protect children in this age group against changes in food availability to the household. It implies that various factors contribute to how these different age groups are affected by conflict.

In terms of anthropometry, we find children in both age groups are affected by conflict. Table A5 shows the coefficients and p-values for the two groups are not statistically different. WHZ decreased for children 36 months and below and this effect is significant at the 5 percent level. The effects on children between 37 and 60 months are negative and statistically significant at the 1 percent level. While the coefficient estimate is smaller in the older age group, the difference of the estimated effects is not statistically significant. However, the WHZ of the younger group is lower than that of the older children. The average WHZ being 0.28 standard deviations below zero for younger children, while the older children are close to zero.[16] The level difference combined with the differing effect size calls for attention since the negative effects are more salient among the younger children. This result is alarming since child growth at a younger age could have a persistent effect on child development over time. Consistently, the increase in the probability of being extremely wasted is statistically significant at the 10 percent level among younger children only.

Nevertheless, results on illnesses and their treatment are concentrated among older children (37 to 60 months). As shown in Table A6, the increase in the incidence of diarrhea is statistically significant among this age group only, at the 1 percent level.[17] Note that, on average, diarrhea is less prevalent in the older age group than among younger children. The prevalence rate of diarrhea is 16 percent among the older children, while it was 29 percent among the younger children (Table A3).

In both age groups, just over half of the cases of both diarrhea and fever led to seeking treatment for the condition (Table A3). However, only for the older children are the reductions in seeking health care statistically significant, both in case of fever and cough as well as in the case of diarrhea.[18]

[16] The summary statistics on outcome and control variables by age are presented in Table A3.

[17] In fact, the p-value of the average effect is smaller than 0.01 (Column (3) Panel B), implying strong and statistically significant effects in this older age group.

[18] As data on nutritional intake was collected only among the 36-month-old children and younger, we do not show age heterogeneity for this set of results.

6.5 Child labour and schooling

Conflict might also affect how children use their time. We can investigate this by using data from an older group of children, aged between 5 to 17 years, who are most often engaged in either work or schooling. Evidence from Northeast Nigeria shows that Boko Haram activity reduced school attendance (Bertoni et al., 2019). While the authors do not investigate effects on child labor, a reduction in time spent in school could result in increased child labour or time spent on household chores. Children's time use may also be affected as an intra-household substitution effect if adults' time use changes due to conflict. A similar substitution effect may occur in the absence of conflict, whereby an increase in child labour can happen as a response to a decrease in adults' economic activities or a decrease in income due to some other reason. For instance, foregone income could be substituted by engaging children in subsistence farming. However, security threats from conflict and constraints in mobility may decrease children's participation in any activity outside the household, both economic activities and schooling. Overall, we do not have strong priors in the direction of the net effect.

Results on child labour and schooling are presented in Table 5. Columns (1) and (2) are for the extensive margin of child labour; the dependent variables are dummies denoting whether a child of age 5-17 worked at any economic activity (outside of the household), and participated in household tasks, respectively. Indeed, child labor is highly prevalent; over 50 percent of children involved in economic activities, while as many as 77 percent of children in this age group participate in household tasks. While we find no effect in the participation in economic activities outside the household, we do find an increase in the share of children participating in household tasks, an effect which is significant at the 5 percent level. This 3.8 percentage points increase translates to 5 percent from the mean in the number of children participating in any household tasks. Column (3)-(5) of Table 5 shows results for children's educational outcomes. If there was a reduction in school attendance, measured by whether a child attended school during any time of the school year 2013-14, we could hypothesize that the very first attacks in 2013 led to pulling children entirely out of school during the school year 2013-14. However, we find that attendance did not change substantially. On the other hand, the propensity to drop out of school between the 2012-13 and 2013-14 school years increased. It implies that we do find an increase in the *change* of attendance from one school year to another. Given that on average only 0.7 percent of children drop out at all, our mean effect of 0.8 percentage points indicates a doubling in dropout as a consequence of conflict. Column (5) shows results for a variable "Never went to school", which could not reasonably have been affected by the conflict for the vast majority of the sample, as they started school before the conflict began. Therefore this dependent variable can be considered a placebo-check, and the null result shows that this holds.

The evidence suggests that children are less likely to be engaged in the activities outside of the household – namely, going to school while increasing tasks inside the household. Together with the results on children under five years of age, the results suggest that there are disruptions to child human capital in one form or another, in both age groups.

6.6 Alternative mechanisms

We examined the effect of conflict on child outcomes finding that WHZ is negatively impacted. To explain the results, we provided evidence that the decrease in access to medical care is a likely mechanism. Moreover, we also found an increase in older children's participation in household tasks and increased school dropout.

Other potential mechanisms could explain the worsened child health and nutritional outcomes. First, violent conflicts may generate casualties, including children. Or, the deteriorated economic and physical environment could lead to an increase in child mortality through changes in illnesses or nutrition. If the conflict led to changes in child mortality, it could be that the sample of children alive and surveyed in 2014 is different from children surveyed before the conflict. To address this concern, we estimate the effects of conflict on mortality outcomes of children under five using birth history information from MICS 2014, which collects the birth histories of women of childbearing age, whether the children born survived or died, and at what age did the death occur. Thus, we have information on births that have occurred even decades prior to the survey, given that this module is administered to all women 15-50 years of age. We investigate four mortality variables that may be affected by conflict: neonatal mortality, infant mortality, under-five mortality, and child mortality. Neonatal mortality includes deaths in the first month of life. It may be affected by conflict if women are less likely to give birth safely in a health care facility. Infant mortality concerns children under 12 months of age. It includes neonatal mortality and deaths after the first month, which can occur due to illnesses, among other things. Under-five mortality denotes whether the child died before reaching the age of five, and child mortality denotes whether the child died between the first and the fifth birthday. That is, under-five mortality includes neonatal and infant mortality, while child mortality does not. Table A9 shows that an additional conflict-related fatality does not substantially affect any of the mortality outcomes. We do not detect any changes in any of the four mortality measures as a consequence of conflict. Our results are similar to those presented by Akresh et al. (2012b) for child mortality in the context of the Eritrean–Ethiopian civil war.

Next, we examine if the out-migration of better-off households with healthier children could explain the results. In Table A8, we run models with demographic characteristics of the household as the dependent variable, and the independent variable in each regression is the fatalities in 20km radius. We can see that the demographic characteristics are not strongly or in economically meaningful magnitude correlated with the fatalities, suggesting that the endogenous out-migration does not seem to drive the results.

6.7 Robustness checks

We run several robustness checks to our main results. First, we run a placebo check where we randomly assign the values of the conflict variables to our households. We repeat this exercise for 1,000 iterations such that the average of the coefficients, standard errors, and t-statistics are presented in Table 6. We find that all of the coefficient estimates are statistically insignificant, as expected.

Next, as an alternative to the birth cohort-specific trends, we control for intra-annual seasonality in birth outcomes. We do this exercise since intra-annual seasonalities – such as agricultural seasonalities – may impact children differentially in-utero or during first months of life. To do so, we included birth-month and birth-year dummies separately, replacing birth-year times birth-month fixed effects. Table A10 presents the result of this robustness check for the models with controls of Tables 2 and 3. We can see that our results are robust to this specification.

Additionally, we assess the sensitivity of our findings to an alternative distance threshold to define conflict exposure by increasing the threshold to 40km. The results are presented in Table A11. We find that the results are robust to this sensitivity check – the results retain their statistical significance. However, we do find that the effect sizes are smaller as the threshold distance increases. An additional fatality further away is less detrimental to the child than those closer to the household.

Finally, we investigate the sensitivity of our results regarding the timing of the attacks. We investigate fatalities in attacks in the 20km radius that occurred in the last 3, 4, 6, 9 10, and 24 months, in addition to the 12 months used in the main analysis.[19] The results are presented in Figure 3. We can see that the results are not sensitive to the timing of the events; the size of the coefficients varies little across the different specifications.

7 Conclusions and Policy Implications

In this paper, we examine the immediate impact of violent conflict on various child outcomes using datasets collected up to a decade before and immediately after the eruption of Boko Haram violence in Northern Cameroon. We find that children under five experienced immediate negative health setbacks as a result of the conflict. The effects were similar for both infants as well as the older children in this age group. In particular, we find that fatalities in geographic proximity lead to a decrease in WHZ.

Low WHZ is often a result of illnesses or poor nutrition. We find that conflict increased the prevalence of diarrhea but not the prevalence of fever and cough, common symptoms of malaria. We also find a decrease in health service use for treating the highly prevalent diarrhea and fever. This result implies that the common illnesses may have been left untreated, increasing the severity of the illness. We do not find that conflict reduced dietary diversity, which was already very low before the conflict. The reduced access to health care seems to be the most immediate consequence of the conflict, contributing to lower WHZ among under-five children.

Furthermore, we find that exposure to conflict changed older children's time use towards household chores and away from schooling. Children between 5-17 years of age are more likely to participate in household tasks, and some children drop out of school due to conflict. It implies

[19] Note that between 12 to 24 months very few events took place, the vast majority of fatalities will have occurred 12 months prior to the survey.

that households consider activities inside the household relatively safer than activities outside the household, but this may come as at the expense of disrupting human capital accumulation.

Our results carry strong policy relevance as an increasing share of the world's poor and undernourished populations will be concentrated in conflict-affected countries in the following decades (Corral et al., 2020). Given that the disrupted health care use is a potential channel through which children's nutritional status is affected immediately, policies for rapid recovery can focus on providing health care services for the population in conflict-affected areas. Indeed, programs targeted for health care center reconstruction and efforts to bring back health care workers and supplies have been underway in Nigeria (World Bank, 2016), and responses by NGOs such as Doctors without Borders have taken place in both countries. In the long term, if violent attacks such as the Boko Haram attacks and other forms of terrorism continue, policymakers can also focus efforts on building health care infrastructure to be more resilient in insecure settings. Such policies can include training of health care workers and increasing the mobility of services to respond to the evolving geographical distribution of conflict risk.

Cameroon is currently experiencing several conflicts within its borders. While the Boko Haram conflict subsided after its peak in 2014, violence reached a new historical peak in 2020 when there were more Boko Haram attacks against civilians in Cameroon than in Nigeria, Chad, and Niger combined (Africa Center, 2020). In addition to the Boko Haram violence, the Anglophone crisis, a secessionist insurgency, erupted in the western parts of Cameroon in late 2016, creating more insecurity in the country. The insurgency and counterinsurgency operations have resulted in armed clashes, displacements, and a persistently deteriorated security situation (Craig, 2021; International Crisis Group, 2017b). Indeed, with two ongoing conflicts in the country, there is a growing concern that Cameroon is becoming a 'fragile state' after decades of peace. Therefore, the government's capacity to build peace and economic recovery under these dire circumstances is limited, which calls into question the modalities of funding these efforts.[20]

The eruption of the Boko Haram conflict in Cameroon coincides with a time of increased poverty. The total number of poor in Cameroon increased by 12 percent to 8.1 million between 2007 and 2014, with over half of the poor living in Northern Cameroon. Coupled with concerns of weak governance (World Bank, 2019), which could have contributed to the fact that Boko Haram could gain power in the country, the policy response to the conflict should be accommodated to this evolving context.

[20]There are many questions about the aid-conflict relationship that are relevant for this policy discussion (Mary and Mishra, 2020; Christian and Barrett, 2019). We abstract away from making recommendations on the mode of financing policies for conflict-affected areas.

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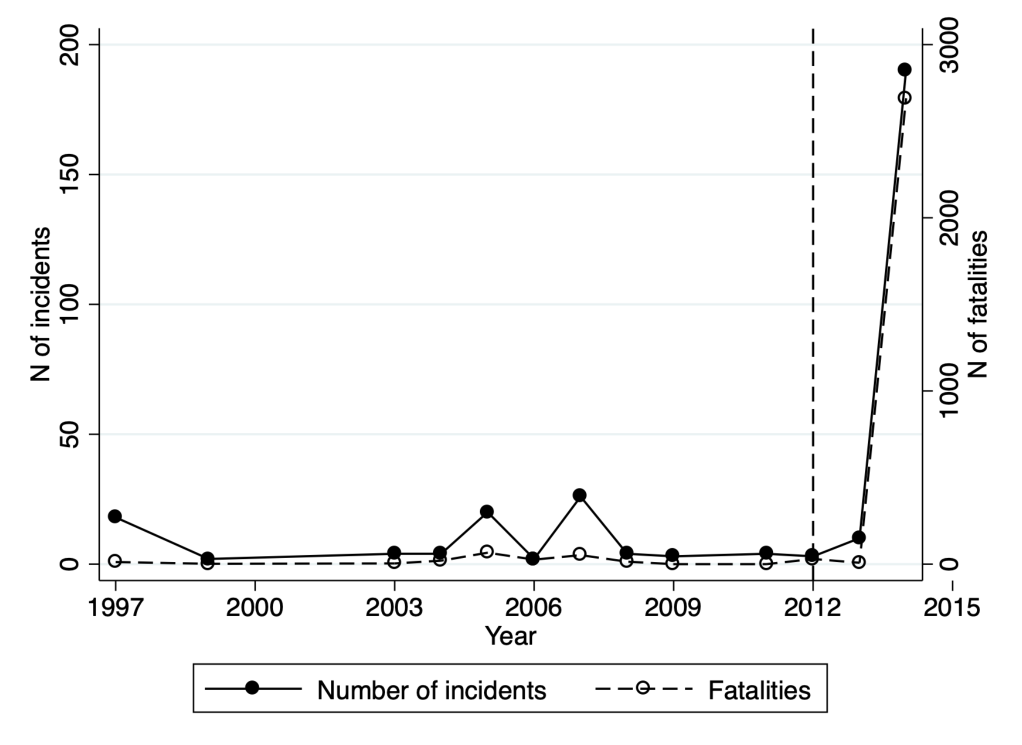
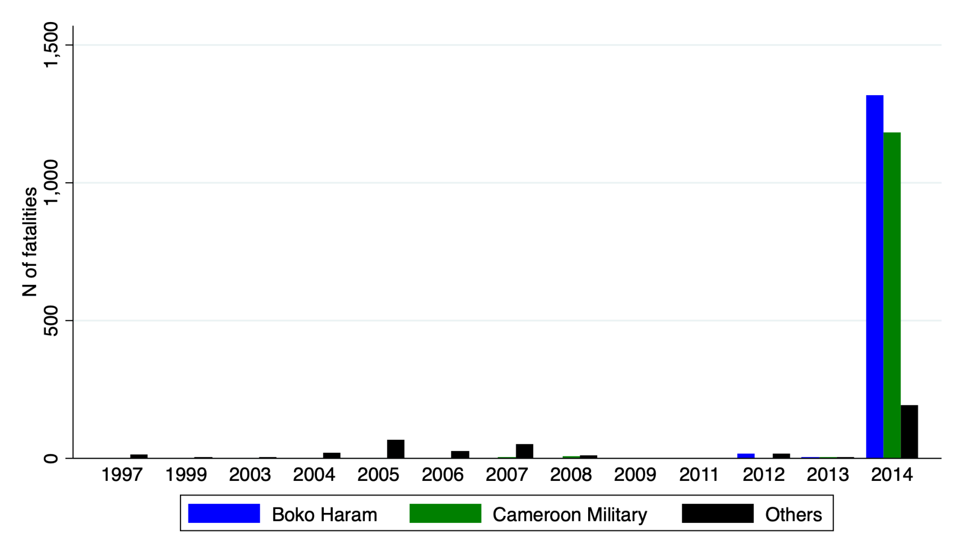
Figures

Figure 1: Evolution of Conflict in Northern Cameroon

(a) Fatalities and Incidents by year



(b) Fatalities by group-year



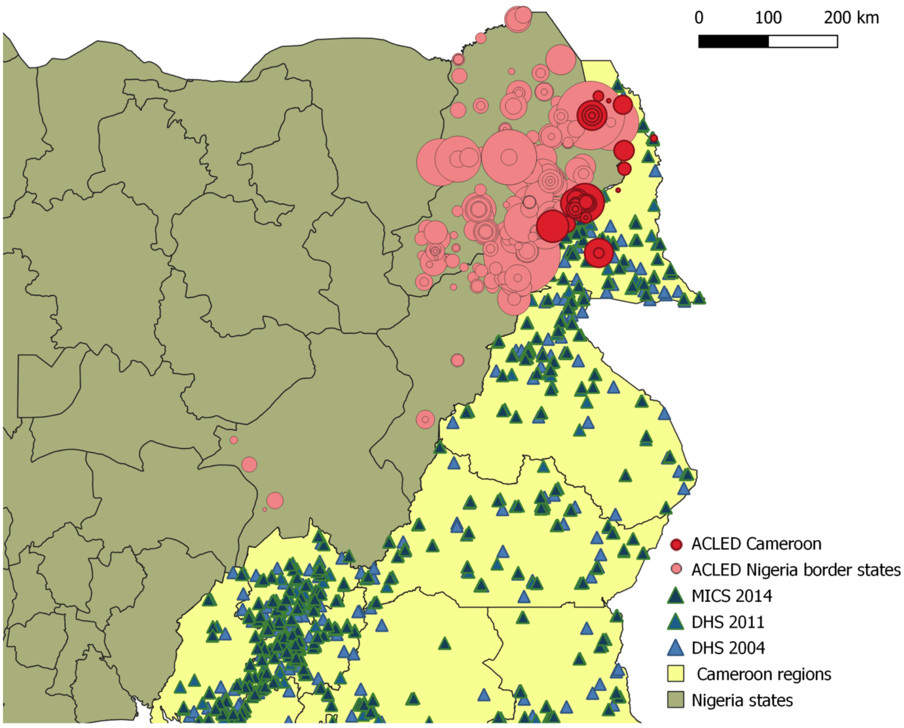
Notes: In panel (a) Incidents denotes the number of fatal events in Northern Cameroon by year as reported in the ACLED database. We include all events except riots and protest in our measure of incidents. Fatalities denotes the number of fatalities in these events. In panel (b) the number of fatalities are reported by actor involved in the incident. Most fatalities occur in clashes between the Boko Haram and Cameroon military.

Source: ACLED dataset (Raleigh et al. (2010))

Figure 2: Map of Conflict Region and Boko Haram Attacks

(a) Conflict Region

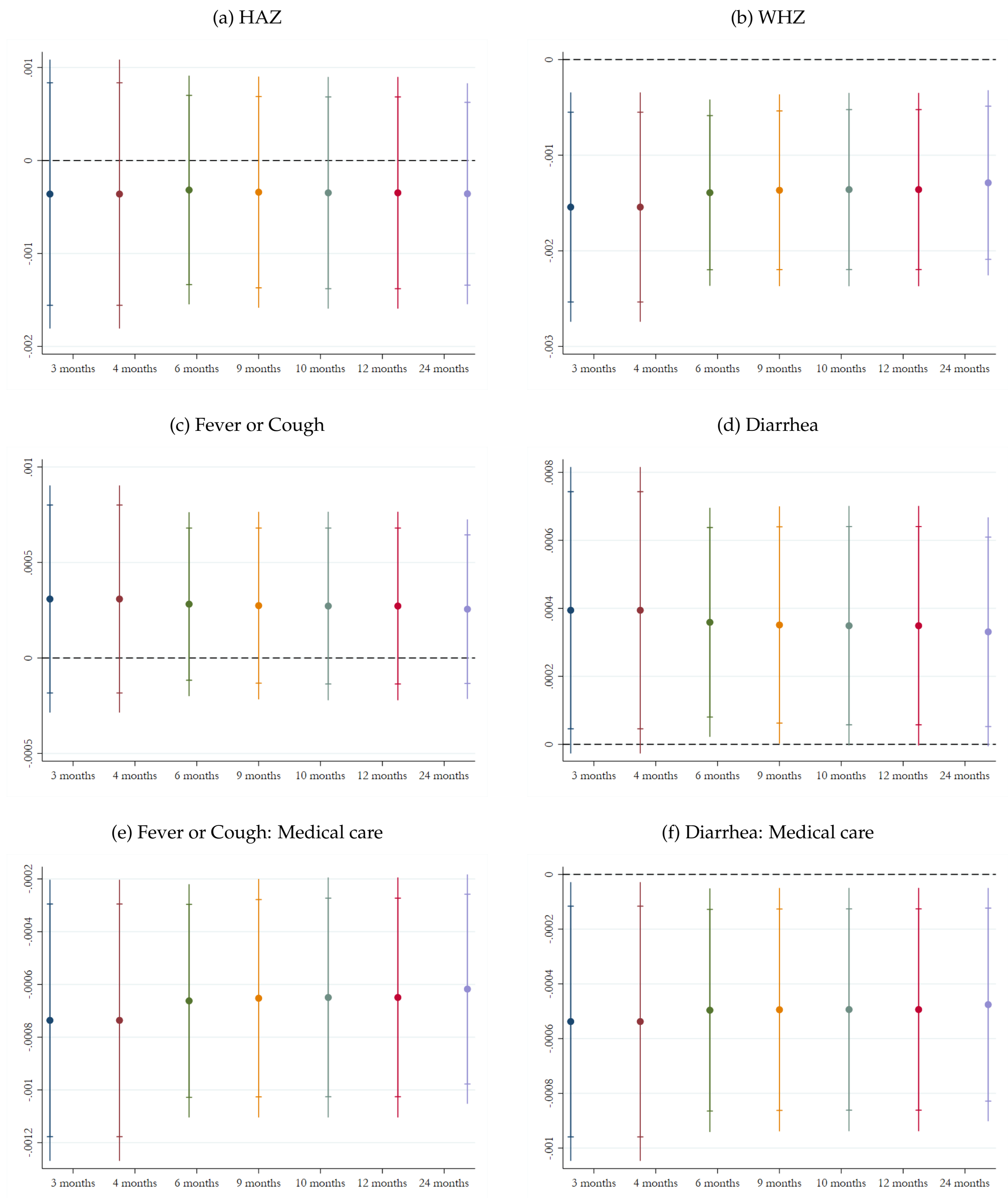
(b) Boko Haram attacks in Cameroon and Bordering States in Nigeria



Notes: In Figure (a) the square displays the location of northern Cameroon. In Figure (b) the blue triangles labeled MICS 2014, DHS 2011 and DHS 2004 denote the survey clusters. The light and dark red circles denote incidents from ACLED dataset involving Boko Haram. The size of the circle is inflated reflecting the number of fatalities. This is done using the QGIS software marker size properties Flannery scaling method with exponent 0.57.

Source: Figure (a) compiled using ARCGIS online mapping tool https://www.arcgis.com/home/webmap/viewer.html?webmap=0afd058d737b45c6bcc47eb133286b92. Figure (b) uses shapefiles Cameroon and Nigeria (for regions and states, respectively) downloaded from https://data.humdata.org/

Figure 3: Effect on anthropometric measures by months of exposure



Notes: The bars denote the coefficient estimate of a regression that estimates the effect of the number of fatalities in the 20km radius to the outcome variable in each panel. The vertical axis denotes the magnitude of the coefficient with 95 per cent confidence intervals. The horizontal axis denotes the recall period which is different for each regression. This ranges from 3 to 24 months. The 12 month coefficient estimate thus corresponds to results presented in Tables 2 and 3.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Tables

Table 1: Summary Statistics

	Mean	SD	N
Panel A: Conflict Events			
N of BH related events	61.00	0.00	61
N of fatalities	21.85	35.26	61
Panel B: Control variables			
Female child	0.50	0.50	11275
Age in months	29.15	17.28	11224
Household size	8.08	4.41	11275
Female-headed household	0.12	0.33	11275
wealth index factor score (5 decimals)	-0.64	0.70	11275
Mother: Age	28.04	6.99	11077
Mother: Currently married	0.91	0.29	11077
Christian	0.50	0.50	11275
Muslim	0.38	0.48	11275
Rural area	0.73	0.44	11275
Mother: Primary school	0.37	0.48	11275
Mother: Secondary school	0.11	0.32	11275
Mother: More than secondary school	0.01	0.08	11275
Panel C: Outcome variables, 0-5 years old			
Height-for-Age Z-score	-1.42	1.64	6068
Weight-for-Height Z-score	-0.15	1.37	5750
Had fever in last 2 wks	0.34	0.47	10292
Had diarrhea in last 2 wks	0.24	0.43	10037
Diarrhea: Seek medical treatment	0.55	0.50	2189
Fever: Seek medical treatment	0.58	0.49	3281
No. of food groups	1.94	1.52	6593
Food groups > 4	0.17	0.38	6593
Panel D: Outcome variables, 5-17 years old			
Economic Activities	0.55	0.50	6206
Household Tasks	0.77	0.42	6206
Attended School	0.62	0.48	5924
Dropped Out	0.01	0.08	5924
Never Went to School	0.34	0.47	6158

Notes: The variable No. of food groups takes values between 0 and 6. The omitted category in Mother's education is no education. Column (1) reports the mean, column (2) the standard deviation, and column (3) the number of observations for each variable.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table 2: Effect on Anthropometric Measures of Children (0-60 Months-old)

	HAZ	WHZ	Stunted	Wasted	Extremely Stunted	Extremely Wasted
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Fatalities	-.000347	-.00136**	.000034	-.0000343	-.000214	.000178*
	(.000599)	(.000486)	(.000222)	(.000103)	(.000335)	(.0000926)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Coef: Average effect	-0.030	-0.116	0.003	-0.003	-0.018	0.015
P-val: Average effect	0.568	0.011	0.880	0.742	0.530	0.068
R-Squared	0.163	0.209	0.123	0.107	0.095	0.085
Panel B: Without control variables						
Fatalities	-.000984*	-.00224**	.000139	7.08e-06	-.000176	.000166*
	(.000503)	(.000801)	(.000217)	(.000114)	(.000305)	(.0000867)
Coef: Average effect	-0.084	-0.191	0.012	0.001	-0.015	0.014
P-val: Average effect	0.064	0.011	0.529	0.951	0.570	0.069
N	6068	5750	6068	5750	6068	5750
R-Squared	0.139	0.175	0.101	0.098	0.081	0.077
Mean of Dep. Var.	-1.421	-0.155	0.375	0.089	0.163	0.028

Notes: Sample includes children under 5 years of age. Panel A includes control variables, Panel B does not include control variables. Controls include all variables listed in Table 1 Panel B. All regressions include Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.
Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table 3: Effect on Children's Illnesses and Use of Medical Care (0-60 Months-old)

	Fever or cough		Diarrhea	
	Illness in 2 weeks	Seek medical care	Illness in 2 weeks	Seek medical care
	(1)	(2)	(3)	(4)
Panel A				
Fatalities	.000272	-.000649***	.000349*	-.000494**
	(.000237)	(.000219)	(.000169)	(.000214)
Control	Yes	Yes	Yes	Yes
Coef: Average effect	0.023	-0.055	0.030	-0.042
P-val: Average effect	0.264	0.007	0.052	0.031
R-Squared	0.086	0.115	0.103	0.176
Panel B: Without control variables				
Fatalities	.000358	-.000764***	.000396	-.000466***
	(.00027)	(.000262)	(.000232)	(.000153)
Coef: Average effect	0.030	-0.065	0.034	-0.040
P-val: Average effect	0.199	0.008	0.102	0.006
N	10292	3281	10037	2189
R-Squared	0.084	0.095	0.097	0.144
Mean of Dep. Var.	0.336	0.581	0.242	0.549

Notes: Sample includes children under 5 years of age. In columns (2) and (4) the sample is restricted to children who had been ill with fever or cough, or diarrhea, respectively. Panel A includes control variables, Panel B does not include control variables. Controls include all variables listed in Table 1 Panel B. All regressions include Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.
Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table 4: Effect on Food Intake (0-36 Months-old)

	Food groups > 4	No. of food groups	Starchy Staples	Legumes/ Nuts	Meat and eggs	Dairy	Vegetables	Fruits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A								
Fatalities	.000176	.000887	.0000205	-.000367**	-.0000278	.00109***	-.000191	.000369**
	(.000185)	(.000552)	(.0000797)	(.000159)	(.000189)	(.000363)	(.000299)	(.00015)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coef: Average effect	0.015	0.076	0.002	-0.031	-0.002	0.093	-0.016	0.031
P-val: Average effect	0.352	0.123	0.800	0.031	0.885	0.007	0.531	0.023
R-Squared	0.150	0.378	0.361	0.116	0.303	0.125	0.211	0.155
Panel B: Without control variables								
Fatalities	.000273*	.00115***	.0000273	-.000297*	.0000401	.00108**	-.0000553	.000364**
	(.000154)	(.000365)	(.0000709)	(.000161)	(.00012)	(.000447)	(.000286)	(.000157)
Coef: Average effect	0.023	0.098	0.002	-0.025	0.003	0.092	-0.005	0.031
P-val: Average effect	0.091	0.005	0.704	0.079	0.742	0.025	0.849	0.031
N	9751	9751	9751	9735	9748	9748	9750	9735
R-Squared	0.131	0.368	0.366	0.113	0.287	0.084	0.207	0.136
Mean of Dep. Var.	0.151	1.742	0.629	0.202	0.281	0.127	0.348	0.155

Notes: Sample includes children under 36 months of age. All dependent variables denote food intake in the last 24 hours preceding the survey. Outcome variables in Columns (3)-(8) are dummy variables denoting whether the child consumed anything from this food group in the last 24 hours. Food groups > 4 is a dummy for whether the child ate from more than 4 out of 6 food groups in the last 24 hours. The variable number of food groups denotes the number of food groups a child consumed from (taking values from 0 to 6). Panel B: Without control variables A includes controls, Panel B: Without control variables B does not. Controls include all variables listed in Table 1 Panel B: Without control variables A. All regressions include Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.
Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011.

Table 5: Effect on Child Schooling and Labor (5-17 years old)

	Work		Schooling		
	Economic activities	Household tasks	Attended school	Dropped out	Never went to school
	(1)	(2)	(3)	(4)	(5)
Panel A					
Fatalities in 20km	-.000661	.000413**	.00106	.0000947***	.00125
	(.000463)	(.000191)	(.000826)	(.0000327)	(.00098)
Control	Yes	Yes	Yes	Yes	Yes
Coef: Average effect	-0.060	0.038	0.096	0.009	0.115
P-val: Average effect	0.169	0.042	0.215	0.009	0.215
R-Squared	0.199	0.215	0.325	0.013	0.354
Panel B: Without control variables					
Fatalities in 20km	-.000547	.000411*	.00102	.0000916**	.00142
	(.000451)	(.000207)	(.000803)	(.0000356)	(.00101)
Coef: Average effect	-0.050	0.038	0.093	0.008	0.130
P-val: Average effect	0.239	0.060	0.219	0.018	0.177
N	6206	6206	5924	5924	6158
R-Squared	0.176	0.195	0.288	0.008	0.317
Mean of Dep. Var.	0.546	0.770	0.623	0.007	0.340

Notes: Sample includes children 5-17 years of age. Dependent variables in columns (1) and (2) are dummy variables denoting whether the child participated in any economic activities outside of the household, and in household tasks, respectively, in the 7 days preceding the survey. Dependent variables in columns (3)-(5) are dummy variables denoting school attendance in the 2013-14 school year, whether the child dropped out between the 2012-13 and 2013-14 school years, and whether the child ever attended school. Panel A includes control variables, Panel B does not include control variables. Controls include all variables listed in Table 1 Panel B. All regressions include Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.
Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2011, and the ACLED dataset.

Table 6: Impact of conflicts at random locations

	HAZ	WHZ	Fever	Fever: Seek medical care	Diarrhea	Diarrhea: Seek medical care
	(1)	(2)	(3)	(4)	(5)	(6)
Fatalities in 20km	-0.00008	0.00004	-0.00001	-0.00003	-0.00003	-0.00002
	(0.0008)	(0.0008)	(0.0002)	(0.0004)	(0.0002)	(0.0005)
	[0.103]	[0.052]	[0.025]	[0.079]	[0.134]	[0.036]

Notes: Sample includes children under 5 years of age. In each of 1000 iterations, the number of fatalities from conflicts were randomly placed within sample regions and the effects are estimated. The presented coefficients and standard errors are the average of those 1000 iterations. Controls include all variables listed in Table 1 Panel B. All regressions include Birthyear $\times$ Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis and the t-statistics are in brackets.
Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2011, and the ACLED dataset.

Appendix

Table A1: Summary Statistics by Survey Year

	2004			2011			2014		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Panel A: Control variables									
Female child	0.50	0.50	3261	0.52	0.50	5382	0.47	0.50	2632
Age in months	29.64	17.22	3261	28.98	17.42	5382	28.83	17.06	2581
Household size	8.15	4.79	3261	8.22	4.31	5382	7.69	4.04	2632
Female-headed household	0.12	0.32	3261	0.11	0.32	5382	0.16	0.37	2632
wealth index factor score (5 decimals)	-0.65	0.68	3261	-0.65	0.69	5382	-0.60	0.77	2632
Mother: Age	27.64	6.90	3261	28.06	6.91	5382	28.58	7.30	2434
Mother: Currently married	0.92	0.27	3261	0.92	0.27	5382	0.86	0.35	2434
Christian	0.47	0.50	3261	0.50	0.50	5382	0.53	0.50	2632
Muslim	0.37	0.48	3261	0.40	0.49	5382	0.35	0.48	2632
Rural area	0.71	0.45	3261	0.74	0.44	5382	0.77	0.42	2632
Mother: Primary school	0.35	0.48	3261	0.37	0.48	5382	0.41	0.49	2632
Mother: Secondary school	0.07	0.26	3261	0.09	0.28	5382	0.23	0.42	2632
Mother: More than secondary school	0.00	0.05	3261	0.01	0.08	5382	0.01	0.12	2632
Panel B: Outcome variables, 0-5 years old									
Height-for-Age Z-score	-1.50	1.73	1337	-1.51	1.68	2299	-1.29	1.54	2432
Weight-for-Height Z-score	-0.24	1.40	1204	-0.30	1.38	2091	0.01	1.33	2455
Had fever in last 2 wks	0.23	0.42	2903	0.35	0.48	4808	0.44	0.50	2581
Had diarrhea in last 2 wks	0.21	0.41	2800	0.28	0.45	4656	0.22	0.41	2581
Diarrhea: Seek medical treatment	0.44	0.50	529	0.56	0.50	1160	0.64	0.48	500
Fever: Seek medical treatment	0.66	0.47	604	0.55	0.50	1541	0.58	0.49	1136
No. of food groups	2.02	1.57	1851	1.68	1.43	3079	2.35	1.52	1663
Food groups > 4	0.21	0.41	1851	0.11	0.32	3079	0.23	0.42	1663
Panel C: Outcome variables, 5-17 years old									
Economic Activities				0.55	0.50	4516	0.54	0.50	1690
Household Tasks				0.77	0.42	4516	0.81	0.39	1690
Attended School				0.62	0.48	4468	0.92	0.27	1456
Dropped Out				0.01	0.08	4468	0.01	0.09	1456
Never Went to School				0.34	0.47	4468	0.18	0.38	1690

Notes: Number of food groups takes values between 0 and 5. Column (1) to (3) reports mean and standard deviations (in parenthesis) of the variables while Column (4) reports the mean difference and its p-values in parenthesis between the conflict exposed area prior to conflict events and never-exposed areas.
Source: Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A2: Mean comparison of variables by conflict exposure in 2014

	Conflict in 20km		No conflict in 20km		Conflict vs. No-conflict		N
	Mean	SD	Mean	SD	Coef.	SE	
Panel A: Control variables							
Female child	0.464	[0.500]	0.473	[0.499]	-0.009	(0.014)	2581
Age in months	30.4	[17.4]	28.7	[17.0]	1.68	(1.07)	2581
Household size	8.65	[5.70]	7.59	[3.81]	1.06	(0.880)	2581
Female-headed household	0.097	[0.297]	0.170	[0.376]	-0.073**	(0.034)	2581
wealth index factor score (5 decimals)	-0.920	[0.808]	-0.563	[0.757]	-0.357	(0.211)	2581
Mother: Age	29.5	[6.98]	28.5	[7.32]	1.01*	(0.518)	2416
Mother: Currently married	0.931	[0.254]	0.853	[0.354]	0.078***	(0.028)	2416
Christian	0.219	[0.414]	0.560	[0.496]	-0.342***	(0.110)	2581
Muslim	0.568	[0.496]	0.326	[0.469]	0.242	(0.219)	2581
Rural area	0.845	[0.362]	0.757	[0.429]	0.089	(0.120)	2581
Mother: Primary school	0.158	[0.365]	0.432	[0.495]	-0.274***	(0.081)	2581
Mother: Secondary school	0.131	[0.338]	0.244	[0.429]	-0.113	(0.081)	2581
Mother: More than secondary school	0	[0]	0.015	[0.121]	-0.015***	(0.005)	2581
Panel B: Outcome variables, 0-5 years old							
Height-for-Age Z-score	-1.30	[1.55]	-1.29	[1.54]	-0.010	(0.201)	2432
Weight-for-Height Z-score	-0.603	[1.29]	0.080	[1.32]	-0.683**	(0.261)	2455
Had fever in last 2 wks	0.488	[0.501]	0.433	[0.496]	0.055	(0.072)	2581
Had diarrhea in last 2 wks	0.313	[0.465]	0.207	[0.406]	0.106	(0.070)	2581
Diarrhea: Seek medical treatment	0.643	[0.482]	0.638	[0.481]	0.005	(0.042)	500
Fever: Seek medical treatment	0.460	[0.500]	0.590	[0.492]	-0.130	(0.093)	1136
No. of food groups	2.67	[1.66]	2.31	[1.50]	0.352**	(0.130)	1612
Food groups > 4	0.355	[0.480]	0.219	[0.414]	0.136*	(0.078)	1612
Panel C: Outcome variables, 5-17 years old							
Economic Activities	0.513	[0.502]	0.547	[0.498]	-0.034	(0.035)	1690
Household Tasks	0.856	[0.352]	0.811	[0.391]	0.045**	(0.019)	1690
Attended School	0.840	[0.370]	0.927	[0.260]	-0.087	(0.062)	1456
Dropped Out	0.046	[0.211]	0.007	[0.085]	0.039*	(0.022)	1456
Never Went to School	0.522	[0.501]	0.147	[0.354]	0.376*	(0.218)	1690

Notes: Number of food groups takes values between 0 and 6. The statistics under "Conflict vs. No-conflict" report the mean difference conducted using a t-test on the sample that was exposed to conflict in the 20 km radius in the 12 prior to the survey, and the sample that was not exposed, and the standard error of the t-test are in parenthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01.
Source: Multiple Indicator Cluster Surveys (MICS) 2014, and the ACLED dataset.

Table A3: Summary Statistics by Demographic Groups

	0-36 Months old			37-60 Months old		
	Mean	SD	N	Mean	SD	N
Panel A: Control variables						
Female child	0.50	0.50	6918	0.51	0.50	4306
Age in months	17.43	10.41	6918	47.58	6.51	4306
Household size	7.96	4.38	6918	8.26	4.46	4306
Female-headed household	0.12	0.33	6918	0.13	0.33	4306
wealth index factor score (5 decimals)	-0.63	0.70	6918	-0.64	0.71	4306
Mother: Age	27.15	6.86	6853	29.46	6.97	4206
Mother: Currently married	0.90	0.30	6853	0.92	0.27	4206
Christian	0.51	0.50	6918	0.49	0.50	4306
Muslim	0.37	0.48	6918	0.39	0.49	4306
Rural area	0.73	0.44	6918	0.73	0.44	4306
Mother: Primary school	0.38	0.49	6918	0.35	0.48	4306
Mother: Secondary school	0.12	0.33	6918	0.10	0.30	4306
Mother: More than secondary school	0.01	0.09	6918	0.00	0.06	4306
Panel B: Outcome variables, 0-5 years old						
Height-for-Age Z-score	-1.26	1.71	3901	-1.70	1.46	2167
Weight-for-Height Z-score	-0.28	1.47	3528	0.04	1.18	2222
Had fever in last 2 wks	0.36	0.48	6466	0.30	0.46	3826
Had diarrhea in last 2 wks	0.29	0.45	6408	0.16	0.37	3629
Diarrhea: Seek medical treatment	0.55	0.50	1653	0.53	0.50	536
Fever: Seek medical treatment	0.58	0.49	2180	0.58	0.49	1101
No. of food groups	1.94	1.52	6542	.	.	0
Food groups > 4	0.17	0.38	6542	.	.	0
	5-12 Months old			13-17 Months old		
Panel C: Outcome variables, 5-17 years old						
Economic Activities	0.52	0.50	4965	0.69	0.46	1241
Household Tasks	0.75	0.43	4965	0.86	0.34	1241
Attended School	0.61	0.49	4729	0.70	0.46	1195
Dropped Out	0.01	0.08	4729	0.01	0.10	1195
Never Went to School	0.37	0.48	4925	0.19	0.39	1233

Notes: Number of food groups takes values between 0 and 6. Column (1) to (4) reports mean and standard deviations (in paranthesis) of the variables.
Source: Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A4: Effect on Types of Medical Care Sought

	Upon fever and cough			Upon diarrhea		
	Formal	Informal	Traditional	Formal	Informal	Traditional
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Fatalities in 20km	-.000214	.000312	-.000189*	-.000151	-.000124	-.000612*
	(.000613)	(.000665)	(.0000939)	(.000596)	(.0005)	(.00035)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Coef: Average effect	-0.019	0.028	-0.017	-0.014	-0.011	-0.055
*1 P-val: Average effect	0.731	0.643	0.057	0.802	0.807	0.095
R-Squared	0.242	0.239	0.162	0.215	0.207	0.179
Panel B: Without control variables						
Fatalities in 20km	-.000727	.000773	-.000125*	-.000209	-.000103	-.000518
	(.000526)	(.000577)	(.0000623)	(.00063)	(.000518)	(.000326)
Coef: Average effect	-0.066	0.070	-0.011	-0.019	-0.009	-0.047
P-val: Average effect	0.181	0.194	0.058	0.744	0.844	0.127
N	1271	1271	1271	908	908	908
R-Squared	0.208	0.210	0.144	0.193	0.184	0.162
Mean of Dep. Var.	0.405	0.555	0.057	0.368	0.551	0.112

Notes: Sample includes children under 5 years of age who had been sick with fever (Columns 1-3) or diarrhea (Columns 4-6), and for whom medical care was sought for due to illness. Formal care includes both private and public hospitals and clinics, informal care includes pharmacies and shops, mobile and outreach clinics, and relatives and friends, and traditional care comprises of traditional practitioners. Panel A includes control variables, Panel B does not include control variables. Controls include all variables listed in Table 1 Panel B. All regressions include Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A5: Effect on Anthropometric Measures of Children by Age

	HAZ	WHZ	Stunted	Wasted	Extremely Stunted	Extremely Wasted
	(1)	(2)	(3)	(4)	(5)	(6)
Fatalities in 20km	-.000021	-.00102***	-.000132	-.000121	-.000201	4.00e-06
	(.000998)	(.000336)	(.000357)	(.0000914)	(.000247)	(.0000131)
0-36 Month × Fatalities	-.000316	-.000616	.000151	.000122	.0000234	.000354*
	(.000541)	(.00075)	(.00015)	(.000186)	(.000211)	(.000189)
Coef (37-60 Months): Average effect	-0.002	-0.087	-0.011	-0.010	-0.017	0.000
P-val (37-60 Months): Average effect	0.983	0.006	0.716	0.199	0.426	0.763
Coef (0-36 Months): Average effect	-0.029	-0.140	0.002	0.000	-0.015	0.030
P-val (0-36 Months): Average effect	0.593	0.028	0.944	0.994	0.655	0.079
N	5923	5596	5923	5596	5923	5596
R-Squared	0.190	0.224	0.148	0.125	0.113	0.092
Mean of Dep. Var.	-1.424	-0.160	0.376	0.089	0.162	0.028

Notes: Sample includes children under 5 years of age. All regressions include controls as in Table 2 Panel A, Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A6: Effect on Children's Illnesses and Use of Medical Care by Age

	Fever or cough		Diarrhea	
	Illness in 2 weeks	Seek medical care	Illness in 2 weeks	Seek medical care
	(1)	(2)	(3)	(4)
Fatalities in 20km	.000226	-.0011***	.000522***	-.00208***
	(.000143)	(.000256)	(.000112)	(.000671)
0-36 Month × Fatalities	.0000194	.000639	-.000291	.00177**
	(.000296)	(.000473)	(.000202)	(.000709)
Coef (37-60 Months): Average effect	0.019	-0.093	0.044	-0.177
P-val (37-60 Months): Average effect	0.129	0.000	0.000	0.006
Coef (0-36 Months): Average effect	0.021	-0.039	0.020	-0.026
P-val (0-36 Months): Average effect	0.480	0.236	0.350	0.287
N	10123	3205	9868	2150
R-Squared	0.098	0.145	0.124	0.215
Mean of Dep. Var.	0.335	0.583	0.243	0.547

Notes: Sample includes children under 5 years of age. In columns (2) and (4) the sample is restricted to children who had been ill with fever or cough, or diarrhea, respectively. All regressions include controls as in Table 2, Panel A, Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.
Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A7: Effect on Hours of Work (5-17 years old)

	OLS		Tobit	
	Economic activities	Household tasks	Economic activities	Household tasks
	(1)	(2)	(3)	(4)
Panel A				
Fatalities	-.0199*	.0176	-.0175*	.0189*
	(.00997)	(.0103)	(.00926)	(.0101)
Control	Yes	Yes	Yes	Yes
Coef: Average effect	-1.818	1.612	-1.602	1.724
P-val: Average effect	0.059	0.103	0.059	0.062
R-Squared	0.236	0.149		
Panel B: Without control variables				
Fatalities	-.013	.0185*	-.0175*	.0189*
	(.0114)	(.01)	(.00926)	(.0101)
Coef: Average effect	-1.187	1.687	-1.602	1.724
P-val: Average effect	0.267	0.081	0.059	0.062
N	4092	5202	4089	5195
R-Squared	0.197	0.118		
Mean of Dep. Var.	15.597	8.123	15.611	8.126

Notes: Sample includes children 5-17 years of age. The sample is restricted to children who had participated in economic activities (column 1) and household tasks (column 2). Panel A includes control variables, Panel B does not include control variables. Controls include all variables listed in Table 1 Panel B. All regressions include Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. All models include sample weights. Standard errors clustered at the district level are in paranthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A8: Effect on Stock variables

	Demographic character-stics
	(1)
Female child	.000169***
	(.0000547)
Household size	.00157
	(.00247)
Female-headed household	-.0000507
	(.0000773)
wealth index factor score (5 decimals)	5.57e-19
	(3.53e-19)
Mother: Age	2.02e-18***
	(7.21e-20)
Mother: Currently married	2.51e-20
	(2.06e-20)
Christian	6.82e-19*
	(3.29e-19)
Muslim	.00163*
	(.000857)
Rural area	1.12e-19
	(1.38e-19)
Mother: Primary school	-1.43e-19
	(1.77e-19)
Mother: Secondary school	-.000116
	(.000134)
Mother: More than secondary school	.000028
	(.000024)
Observations	11059

Notes: Sample includes children under 5 years of age. Each row shows a regression where the control variable in question is regressed on the variable denoting number of fatalities in the 20km radius. Each regression includes controls as listed in Table 1 Panel B, excluding for each regression the control variable used as an outcome variable. All models include sample weights. Standard errors clustered at the district level are in parenthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A9: Effect on Mortality Measures

	Neonatal	Infant	U5	Child
	(1)	(2)	(3)	(4)
Panel A				
Fatalities*Post first attack	-.000139	4.43e-06	-.00003	-.0000344
	(.00027)	(.000116)	(.0000464)	(.000116)
Fatalities	.0000836	-.0000276	-.000013	.0000146
	(.000264)	(.000111)	(.0000425)	(.000126)
Post	-.259***	-.57***	-.895***	-.325***
	(.0142)	(.0168)	(.0116)	(.0174)
Control	Yes	Yes	Yes	Yes
Coef: Average effect	-0.012	0.000	-0.002	-0.003
P-val: Average effect	0.754	0.805	0.762	0.909
R-Squared	0.253	0.499	0.784	0.301
Panel B: Without control variables				
Fatalities*Post first attack	-.000138	8.90e-06	-.000032	-.0000409
	(.000275)	(.000115)	(.0000447)	(.000117)
Fatalities	.0000995	-.0000389	1.85e-07	.0000391
	(.00028)	(.000115)	(.0000426)	(.000134)
Post	-.259***	-.572***	-.898***	-.326***
	(.0141)	(.0166)	(.0114)	(.0171)
Coef: Average effect	-0.011	0.001	-0.003	-0.003
P-val: Average effect	0.726	0.738	0.997	0.773
N	9347	9347	9347	9347
R-Squared	0.250	0.498	0.783	0.299
Mean of Dep. Var.	0.035	0.077	0.122	0.045

Notes: Sample includes all births to women of 15-49 years of age surveyed in MICS 2014. The model is a regression where the dependent variables are: Column (1) Neonatal mortality denoting whether the child died during the first month of life. Column (2) whether the child died before first birthday. Column (3) under-five mortality, whether the child died before reaching the age of five. Column (4) Child Mortality, whether the child died after the first birthday but before the fifth birthday. The independent variable interacts the number of fatalities in the 20km radius with a variable Post first attack , an indicator variable taking the value one if the child death occurred after the first Boko Haram attack in the country (April 2012), and zero otherwise. Panel A includes control variables, Panel B does not include control variables. Controls include all variables listed in Table 1 Panel B. All regressions include Birthyear $\times$ Birthmonth fixed effects, and district fixed effects. Standard errors clustered at the district level are in parenthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.

Source: Multiple Indicator Cluster Surveys (MICS) 2014, and the ACLED dataset.

Table A10: Effect on Anthropometric Measures and Illness of Children (Seasonality in Birth Month)

	HAZ	WHZ	Stunted	Wasted
	(1)	(2)	(3)	(4)
Panel A: Anthropometric measures				
Fatalities in 20km	-.000347	-.00136**	.000034	-.0000343
	(.000599)	(.000486)	(.000222)	(.000103)
Coef: Average effect	-0.030	-0.116	0.003	-0.003
P-val: Average effect	0.568	0.011	0.880	0.742
N	5929	5606	5929	5606
R-Squared	0.163	0.209	0.123	0.107
Mean of Dep. Var.	-1.424	-0.162	0.376	0.089

	Fever in 2 weeks	Fever: Seek medical care	Diarrhea in 2 weeks	Diarrhea: Seek medical care
	(1)	(2)	(3)	(4)
Panel B: Illness and medical service use				
Fatalities in 20km	.000272	-.000649***	.000349*	-.000494**
	(.000237)	(.000219)	(.000169)	(.000214)
Coef: Average effect	0.023	-0.055	0.030	-0.042
P-val: Average effect	0.264	0.007	0.052	0.031
N	10127	3207	9872	2159
R-Squared	0.086	0.115	0.103	0.176
Mean of Dep. Var.	0.335	0.582	0.243	0.548

Notes: Sample includes children under 5 years of age. All models include control variables listed in Table 1 Panel B. All regressions include Birthyear fixed effects, and Birthmonth fixed effects, survey wave fixed effects, and commune fixed effects. Standard errors clustered at the district level are in parenthesis. All models include sample weights. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.

Table A11: Effect on Anthropometric Measures and Illness of Children (Sensitivity on Distance to Conflict)

	HAZ	WHZ	Stunted	Wasted
	(1)	(2)	(3)	(4)
Panel A: Anthropometric measures				
Fatalities in 40km	.000274	-.000394*	-.0000355	.0000317
	(.000227)	(.000199)	(.0000819)	(.0000477)
Coef: Average effect	0.055	-0.080	-0.007	0.006
P-val: Average effect	0.240	0.061	0.669	0.513
N	5929	5606	5929	5606
R-Squared	0.163	0.209	0.123	0.108
Mean of Dep. Var.	-1.424	-0.162	0.376	0.089
	Fever in 2 weeks	Fever: Seek medical care	Diarrhea in 2 weeks	Diarrhea: Seek medical care
	(1)	(2)	(3)	(4)
Panel B: Illness and medical service use				
Fatalities in 40km	.000181*	-.000125	.0000597	-.0000316
	(.0000959)	(.000117)	(.0000938)	(.0000692)
Coef: Average effect	0.037	-0.025	0.012	-0.006
P-val: Average effect	0.073	0.295	0.531	0.653
N	10127	3207	9872	2159
R-Squared	0.087	0.115	0.103	0.176
Mean of Dep. Var.	0.335	0.582	0.243	0.548

Notes: Sample includes children under 5 years of age. All models include control variables listed in Table 1 Panel B. All regressions include Birthyear × Birthmonth fixed effects, survey wave fixed effects, and district fixed effects. Variable 'Fatalities in 40km' denotes the number of fatalities within a 40km radius in the last 12 months. All models include sample weights. Standard errors clustered at the district level are in parenthesis. * denotes significance at 0.10; ** at 0.05; and *** at 0.01 level.

Source: Pooled dataset using Multiple Indicator Cluster Surveys (MICS) 2014 and Demographic and Health Survey (DHS) from 2004 and 2011, and the ACLED dataset.