WPS8685

The Relationship between Conflicts, Economic Shocks, and Death with Depression, Economic Activities, and Human Capital Investment in Nigeria

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Abstract

This paper examines the links between adverse events, depression, and decision making in Nigeria. It investigates how events such as conflicts, shocks, and deaths can affect short-term perceptions of welfare, as well as longer term decisions on economic activities and human capital investments. First, the findings show that exposure to conflict has the largest and strongest relationship with depression, associated with a 15.3 percentage point increase in the probability of reporting depressive symptoms (from a base of 22 percent). This is equivalent to a reduction in annual per capita income of around US$52 (in present day terms). Second, the study randomized the timing of the module on adverse events with respect to the mental health module. The analysis finds that individuals who were reminded about their history of adverse events (provided that they had one) have a 6.5 percentage point higher probability of reporting depressive symptoms. The final sets of results show that depression is associated with lower labor force participation and child educational investment. People with depressive symptoms are 8 percentage points less likely to work; this is driven by a reduction in engagement in agricultural activities for men and self-employment for women. In addition, households with a parent exhibiting depressive symptoms spend 20 percentage points less on education. These results suggest that there is a direct link between mental health, welfare perceptions, and decision making, beyond the indirect link via exposure to adverse effects.

The Relationship between Conflicts, Economic Shocks, and Death with Depression, Economic activities, and Human Capital Investment in Nigeria[*]

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1. Introduction

This paper examines the effects of conflicts, economic shocks, and death on depression, and investigates whether depression and adverse events interfere with productive activities and future investment. According to WHO's estimation, depressive disorders are a leading cause of disability, affecting 350 million people worldwide.[1] Lack of recognition and access to treatment for depression and anxiety result in an estimated economic loss of a trillion US dollars every year (Chisholm, Sweeny et al. 2016).

Stressful life events are often associated with an increased probability of depressive disorder. Studies have found economic shocks (Das, Do et al. 2009), paternal loss (Nickerson et al. 2013) and loss of a child (Rosenberg, A. R. et al. 2012) lead to increased likelihood of becoming depressed. Recent studies report political conflict and associated violence have increased the risk of depression in conflict prone areas such as West Bank and Gaza, Colombia, Sri Lanka, West Papua and Georgia (Canetti, Galea et al. 2010, Richards, Ospina-Duque et al. 2011, Senarath, Wickramage et al. 2014, Tay, Rees et al. 2015, Saxon, Makhashvili et al. 2017). While these studies call attention to the impacts of political conflict and violence on mental health, little is still known about their implications on behavior and decision making among people who are affected by conflict as well as estimated economic costs of depression. This paper shows that while experiences of both conflicts and other shocks are associated with self-reported depressive symptoms, the experience of conflict has the largest and strongest relationship with self-reported depression in Nigeria. Experiencing conflict has the same effect on mental health as a reduction in income by US $52.27. We also explore the story that depression and adverse events interfere with productive activities and future investment through lower employment and educational investment.

This paper focuses on Nigeria because the country has been severely impacted by both conflict and economic shocks. In recent years, Nigeria has suffered from security crises caused by conflicts between ethnic groups, farmers, and herdsmen. Some of the more egregious incidents have been committed by Boko Haram, which is responsible for terrorist attacks including the abduction of more than 200 schoolgirls in 2014, and an estimated 20,000 deaths and at least two million displacements.[2] There is also concurrent violence in other regions in the country. Economic and weather-related shocks are also common throughout Nigeria. Recent changes in climate are responsible for the increased frequency of droughts (Abubakar and Yamusa 2013, Shiru, Shahid et al. 2018).

From February to April 2016, the Nigeria National Bureau of Statistics, with the support of the World Bank, conducted the third wave of the nationally-representative household survey called the General Household Survey-Panel (GHS-Panel). Data were collected from about 4,600 households on consumption, income, depression (via a version of the Center for Epidemiological Studies-Depression or CES-D test), family history of conflicts, deaths, weather and economic shocks.[3] In addition, the survey randomized the order of modules in a priming survey experiment:

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[1] http://www.who.int/news-room/detail/30-03-2017--depression-let-s-talk-says-who-as-depression-tops-list-of-causes-of-ill-health

[2] https://www.bbc.com/news/world-africa-42735414

[3] The survey questionnaire also included questions on basic preferences (e.g., risk, time discounting, and trust).

half of the respondents were asked about their experiences with conflicts, deaths, and shocks before the questions on depression, while the other half were asked about their experiences with these adverse events *after* the questions on depression.

Even though previous studies find a clear relationship between adverse events and depression, it is hard to identify whether depression is caused primarily by shocks or lower income. Lund et al. (2010) conduct a meta-analysis on the relationship between poverty and depression in low and middle income countries, and find a positive association between poverty and depression in many studies. Distinguishing whether poverty or adverse events affect mental health and economic activities has important policy implications. If the primary causal link is that low incomes leads to deteriorating mental health, then interventions such as cash transfers and access to credit are likely to be effective. On the other hand, if depression is caused solely by experiencing shocks, interventions that focus on treating depression can be more effective. Although the linkages between poverty, adverse events and depression are difficult to disentagle, this study will examine these linkages and attempt to provide some insights on their relative magnitudes. Through the analysis, we can provide prelimiary guidance on the most effective policy interventions to combat the negative effects.

Furthermore, poverty, adverse events and depression have the potential to be endogenous. For example, people may have fallen into poverty as a result of adverse events or depression. In addition, people may be more strongly impacted by negative shocks because they were already poor or had mental health problems. Although the endogeneity between poverty, adverse events and depression cannot be fully controlled, this study attempts to address the problem by investigating the effects of lagged consumption expenditures from the previous wave of the survey (2012-13) and the experience of adverse events after lagged consumption was observed (between the second and third waves of the survey) on the current level of depression. As GHS-Panel is a panel survey, consumption expenditure information is available from three waves of the survey (2011-12, 2012-13, 2015-16) for the same set of interviewed households.

The results of our analysis suggest that experiencing conflict or idiosyncratic shocks has a significant impact on self-reported level of depression (higher CES-D scores), as well as an increased probability of having depressive symptoms. These results remain consistent when controlling for covariates such as past consumption expenditures. Experience of conflicts in the past two years has the largest and strongest impact on the respondent's depressive symptomology, as it is associated with a 15.3 percentage point increase in the probability of reporting depression.

After establishing the potential causes of depression, we further examine how depression affects household decision making and well-being. Our results indiciate that individual depression is associated with lower labor force participation and child educational investment. Persons with depressive symptoms have a lower likelihood of engaging in any work, particularly in agricultural work (for men) and non-farm work (for women). Finally, parental depression is correlated with a lower likelihood that the family spends any money on education for their children.

We also go a step further to examine measurement and reporting of depression in household surveys. We conducted a survey experiment testing priming effects on depression reporting by randomizing the order in which respondents were asked about negative events and depressive

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symptoms. Asking respondents about past negative events could trigger painful memories and alter their responses on depression (the CES-D). We find that respondents who were primed (i.e. asked about adverse events before being asked about depression) led to higher CES-D scores among respondents who experienced an adverse event. In particular, primed respondents who experienced idiosyncratic shocks had a higher probability of reporting experiencing depressive symptoms compared with respondents who also experienced adverse events but where not primed. On the other hand, respondents who experienced conflicts were not affected by priming. This suggests that the experience of conflicts is salient enough to lead to an increase in depressive symptoms with or without a reminder, but that reminding respondents about idiosyncratic shocks that affected them will alter responses on depression. This finding has important implications for the reliability of the CES-D as a measure of depressive symptoms and highlights the importance of survey design to ensure that the design itself is not driving responses.

The results of this paper have natural policy implications. Policy makers need to do more work to understand the quantitative effects that adverse events can have and what is the causal mechanism. Our findings indicate that mental health is a potential pathway through which adverse events can affect welfare. Our results also suggest that these incidents may be much costlier than previously estimated. Treatment of mental health may be the most effective intervention in conflict or shock-ridden countries and regions. Experimental evidence also indicates that even small treatments of communication and priming are found to have an impact on mental health outcomes.

The paper is organized as follows: Section 2 describes the background literature; Section 3 describes data and research design; Section 4 shows the results; and Section 5 concludes with discussion and policy recommendations.

2. Background literature

This paper focuses on two relationships: (1) the relationship of adverse events with depression, and (2) the relationship of depression with economic activity and investments.

Several studies find support for the first relationship in that deteriorating mental health, and depression in particular, is a significant consequence of acute adverse events such as conflict (Murthy and Lakshminarayana 2006). Recent studies report political conflict and associated violence have increased the risk of depression in conflict prone areas such as West Bank and Gaza, Colombia, Sri Lanka, West Papua and Georgia (Canetti, Galea et al. 2010, Richards, Ospina-Duque et al. 2011, Senarath, Wickramage et al. 2014, Tay, Rees et al. 2015, Saxon, Makhashvili et al. 2017). Das et al. (2009) show that economic and other shocks can have a significant impact on the mental health of household members.

In this same vein, the medical and psychological literature identifies widowhood (Cole and Dendukuri 2003; Sasson and Umberson 2013), paternal loss (Nickerson et al. 2013) and loss of a child (Rosenberg, A. R. et al. 2012) as major life stressors and significant risk factors for depression and other psychiatric issues. In addition, Dinkelman (2017) finds that drought exposure in infancy raises the probability that one suffers from physical and mental disabilities later in their life. Adhvaryu et al. (2016) similarly show that temperature shocks in utero increase depressive

symptoms in adulthood in Africa. Finally, Christian, Hensel et al. (2018) show that income shocks, via a randomized conditional cash transfer, have an effect on suicides in Indonesia.

Not all studies support the above narrative – some find either no or a reversed effect (Hendrickson 2009; Lobb et al. 2010; Kristensen, Weisæth, and Heir 2012). One potential reason for these mixed results is differential treatment of underlying risk factors. After all, the onset of mental health problems during hardships depends on numerous factors, such as wealth, social support, life circumstances, personality type, coping abilities, or previous psychiatric history (Bonanno et al. 2002; Gries et al. 2010).

Controlling these factors may explain some of the differences in findings. The results in this paper, using a novel data set, support the first hypothesis: there is a positive association between negative life events and depression, even after controlling for wealth and other demographic variables. In addition, the very existence of underlying risk factors shown in the second narrative highlights the possibility of contextualized policy interventions, ideally choosing those that are the most effective in a certain setting.

The second relationship – the linkage between depression and economic activity – has also been examined in previous studies. Lerner and Henke (2008) conclude that the vast majority of studies document a negative effect of depression on work outcomes. Individuals with depression have higher unemployment rates, decreased job retention, lower work attendance (absenteeism), and lower on-the-job productivity. Das et al. (2009) also show that mental health impacts labor participation. Lagerveld et al. (2010) identify factors that affect work participation, and find that it is strongly associated with depression duration, and is moderately associated with symptom severity, presence of co-morbid disorders, and older age. Alloush (2017), in a South African data set, uses a generalized method of moments (GMM) approach to find a two-way relationship between psychological well-being (measured via the CES-D 10) and income. Finally, Beck et al. (2011) report that even small changes in depression are linked to productivity loss, thus highlighting the benefits of effective treatment for depression.

In terms of magnitudes of effects, Mitchell and Bates (2011) single out depression as one of the three most expensive health conditions and show that for every dollar of medical cost, there was approximately an additional dollar of productivity cost. The global cost of depression and anxiety disorders, in terms of days of lost productivity, is around one trillion dollars (Chisholm, Sweeny et al. 2016). US workers with depression cost employers an estimated $44 billion per year, while the annual cost of depression in Europe was estimated at euro 118 billion in 2004 (corresponding to a cost of euro 253 per inhabitant (Stewart, Ricci et al. 2003, Sobocki, Jönsson et al. 2006). Chisholm, Sweeny et al. (2016) calculates the costs and returns on investment of depression and anxiety treatments in 36 countries, and finds 5 percent increases in both the ability to work and productivity at work as a result of treatments.

Even though previous studies find a clear relationship between adversity and depression, and depression and resulting economic losses, little is known about whether depression is caused primarily by shocks or lower income. Lund et al. (2010) conduct a meta-analysis on the association between poverty and depression in low and middle income countries, and find a positive

association between poverty and depression in many studies. Education, food insecurity, housing, social class, socio-economic status and financial stress exhibit a strong association with depression. Generally, negative life events are negatively correlated with CES-D scores (e.g. are associated with a lower likelihood of depressive symptomatology; see Radloff (1977). In another study, Lorant et al. (2007) show an interesting asymmetry, whereby the negative effects of a deteriorating socio-economic situation were stronger than the positive effects of an improving situation.[4]

It is also possible that depression leads to behavioral changes, such as lower labor force participation and lower investment in education, which will in turn affect future income.[5] In this study, we first investigate how past consumption and experiences of adverse events are related to present-day depression. We then examine how depression is correlated with economic activities and educational investment, after controlling for prior consumption, education, and socio-economic factors.

Distinguishing whether poverty or negative events affect mental health and economic activities has important policy implications. If the primary channel is that low income leads to deteriorating mental health, then interventions such as cash transfers are likely to be effective. Haushofer and Shapiro (2016) find that unconditional cash transfers have significant impacts on psychological well-being in Kenya. Baird, De Hoop et al. (2013) find evidence that income shocks through cash transfers significantly reduce the psychological distress among Malawian adolescent girls, but that such positive income shocks have negative short-term spillovers among untreated girls. Access to credit also reduces depressive simptoms (Fernald, Hamad et al. 2008).

On the other hand, if depression is caused solely by experiencing shocks, interventions that focus on treating depression can be more effective. For instance, Baranov, Bhalotra et al. (2017) evaluate the long-term impacts of treating depression on mothers. The intervention improved their labor supply, income, and ability to make spending decisions in the long run.

Given the difficulty and sensitivity of measuring both traumatic experiences and depression, we also drew from the literature on survey priming, a tool developed to influence or activate memories or responses by placing a reminder, picture, idea, or other stimulus at the top of mind (Zaller and

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[4] We also look at the effects of conflicts and shocks on individual attitudes and preferences, such as social cohesion and tolerance toward uncertainty. Recent evidence (Malmendier and Nagel 2011; Bracha and Jamison 2012) documents that e.g. risk preferences are not stable but are influenced by economic experiences, with recent events being more salient. However, the evidence on how adverse events impact preferences is mixed. Voors et al. (2012) find that individuals exposed to conflict are more altruistic, risk-seeking, and impatient. Results from Afghanistan demonstrate that such individuals have higher preference for certainty, but only when primed for fear recollection (Callen, Isaqzadeh et al. 2014), and research from Tajikistan concludes that conflicts decrease trust and market participation, and increase the importance of kinship-based relationships (Cassar et al. 2013). The present paper contributes to the evidence that individual characteristics are malleable and shaped by experience (Chuang and Schechter 2015).

[5] Lower levels of cognitive health are strongly associated with increased levels of depression and anxiety among older adults in Sub-Saharan Africa (Payne, Kohler et al. 2016). Depression is also found to lead to engagement in risky sexual behavior among young adults (Averett and Wang 2012).

Feldman 1992, Bargh 2006). Impacts from priming can help keep a mental idea (temporarily) within reach (Hopkins 2011). If framing affects how people internalize their response to various experiences, this is also relevant as a potential policy tool for designing interventions.

In social pyschology and other fields, research has linked priming to attitudes, perception, and preferences, as well as to measurement error and reporting (particularly of sensitive data) (Epley and Gilovich 2001, Rasinski, Visser et al. 2005, Bargh 2006, Steele and Ambady 2006, Mazar, Amir et al. 2008, Van de Walle and Van Ryzin 2011). Priming has also shown impacts on political opinions and candidate preferences, and has been used as a tool in media, speeches, and elsewhere (Druckman and Holmes 2004, Althaus and Kim 2006, Cassino and Erisen 2010, Hopkins 2011, Naoi and Kume 2011).

In an early lab experiment, Lerner and Keltner (2001) concluded that fearful recollections lead to an increase in risk-averse behavior and angry recollections to an increase in risk-seeking behavior. In our setting, one can imagine that recall of conflict could lead to either fear or anger, depending on the individual and the context. Meanwhile, Miranda and Persons (1988) suggest that cognitive vulnerability to depression can be triggered by experimental priming. Most studies report that prior experience modulates this connection, with depressed individuals being more influenced by negative primes (Scher, Ingram et al. 2005). However, the evidence is equivocal (Brockmeyer et al. 2012; LeMoult et al. 2012) and, thus requires further testing.

3. Data and research design

In 2015 and 2016, the Nigerian Bureau of Statistics, with the support of the World Bank Living Standards Measurement Study (LSMS) team, conducted the third wave of the General Household Survey Panel (GHS-Panel) with over 4,500 nationally-representative households. Data were collected on consumption, behavioral preferences, depressive symptoms, history of conflicts (5 years), deaths of family members (2 years), and economic shocks (2 years), among others. We analyze data for the 4,579 households for which we have complete data sets of consumption expenditures,[6] depression scores, economic activities, educational investment and other variables. Our primary unit of analysis is individuals who responded to the included module on depression (only one individual per household).

Table 1 presents the summary statistics of each variable. Seventy-four percent of respondents to the depression module are household heads (with 21 percent of all households being female-headed). Thirty-seven percent of respondents are female, with the average age of the respondents being slightly over 50[7] and the average household size being between five and six. About 74 percent of respondents are married, of which 57 percent are monogamously married, and 17 percent are polygamously married. Some 43 percent are Muslim, while the rest are Christian (with 2 percent having unknown or no religion). On average, 41 percent of the sample lives in an urban

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[6] The methodology implemented when calculating consumption expenditures is included in the survey documentation, available on the World Bank's Micro Data Catalogue.

[7] Note that six of the respondents are under the age of 15. In addition, the average age of the household head is 53.

area. They have 6.75 years of education, which is slightly above primary school completion. On average, respondents worked 32.5 hours in the week prior to the interview.

The GHS-Panel also collects information on household-level adverse events, which we describe as shocks, deaths, and conflicts. We disaggregate shocks into two categories: idiosyncratic and covariate shocks. Idiosyncratic shocks include a variety of scenarios, including death or disability of an adult working member of the household, death of someone who sends remittances to the household, or illness of an income earning member of the household.[8] Covariate shocks include poor rains and floods that caused harvest failure, pest invasion that caused harvest failure or storage loss, loss of property due to fire or flood, and more.[9] Deaths include a death of anyone in the household (from illness, accident, injury, murder, suicide, or other reasons).[10] Finally, conflicts are defined if any family member of or if an individual was killed (in a non-natural death), suffered physical aggression, was injured or disabled, suffered sexual violence, or more.[11]

Although the GHS-Panel has more detailed information on the adverse events, our analysis will primarily focus on binary indicators of whether a household has suffered from a shock (idiosyncratic or covariate), conflict event, or death. Table 1 summarizes experience of adverse events between 2014 and 2016 among sampled households. Seventeen percent of households in our sample experienced one or more covariate shocks, 19 percent experienced one or more idiosyncratic shocks, 11 percent experienced one or more deaths of household members, and 4 percent experienced one or more conflict event.

In addition to the data collected on standard welfare measures and information about adverse events, the survey included a module collecting certain symptoms of depression of the primary respondent.[12] The questions asked of the primary respondent are directly taken form the Center for Epidemiological Studies – Depression (CES-D) scale. Versions of the CES-D, first developed in the 1970s, have been found to be reliable and valid in epidemiological studies as a population-level measure of depression correlated with major depressive disorders, and have been found

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[8] Additional idiosyncratic losses include the loss of an important contact, job loss, departure of income earning member by separation or divorce, departure of income earning member of the household by marriage, nonfarm business failure, theft of crops, cash, livestock or other property, destruction of harvest by fire, dwelling damaged or demolished, loss of land, death of livestock due to illness, kidnapping, hijacking, robbery or assault, and other personal shocks such as job opportunity, reduction of pension, and police arrest.

[9] Additional covariate shocks include an increase in the price of inputs, fall in the price of output, increases in the price of major food items consumed, early stoppage of rain, and communal crisis.

[10] Note that there are fewer than 150 cases in which there may be some overlap between the variables of shocks and deaths. In other words, there is a potential that a household member who reported a death in the shocks module may have reported the same death in the deaths module.

[11] Additional conflicts include a family member being forced to work (for free), captured, kidnapped, abducted, robbed (money or assets), internally displaced, dwelling suffered from robbery or burned down or destroyed, land occupied, expropriated or made unproductive, and had assets intentionally destroyed or damaged.

[12] This is the primary respondent providing information for the household. The protocols for the GHS-Panel specify that the primary respondent should be an adult member of the household who is intimately familiar with the economic activities of the household. The respondent is not predetermined and thus not randomly selected from a list of eligible household members.

useful as a screening instrument for the identification of major depression (Radloff 1977, Irwin, Artin et al. 1999, Morin, Moullec et al. 2011, Quiñones, Thielke et al. 2016, Mohebbi, Nguyen et al. 2017).

While the original test consisted of 20 questions on depression symptoms over the past week, Kohout, Berkman et al. (1993) analyzed two shorter (10- and 11-item) modules which had acceptable reliability and comparability to the original. The CES-D-10[13] version of the instrument was thus used in Nigeria. A cutoff score of 10 (out of 30) is used to indicate depressive symptomatology; the use of different cutoffs has a variety of trade-offs (Andresen, Malmgren et al. 1994, Björgvinsson, Kertz et al. 2013). Table 1 shows the average CES-D depression score was 7.05, and 22 percent of our respondents – and 23 percent of household heads - are considered to have depressive symptoms (with a CES-D score being higher than 10).[14]

Collecting data on these sensitive topics is challenging, particularly in this context. As a result, the way in which the information is collected can potentially affect survey responses. In order to test one potential consequential design choice, a survey experiment was conducted which varied the placement of modules on adverse events and depression (CES-D-10). There were two variants: (1) respondents were asked about adverse events before adminsitering the CES-D, the *primed* sample and (2) respondents were adminstered the CES-D-10 and then asked about adverse events. Households within enumeration areas were randomly assigned to one of the variants. Our initial hypothesis was that respondents who are primed (asked about adverse events first) could have certain memories of the events triggered and thereby increase the likelihood of reporting depressive symptoms. Another similar angle is that households that have not suffered any adverse events might feel more fortunate and happy when reminded that they have not suffered these events (asking about them first) and thus are less likely to report depressive symptoms in the CES-D.

Columns 4 to 6 of Table 1 present results from a balance check of priming treatment status. Overall, the priming "intervention" is well balanced. Most of the variables are not statistically different by the treatment status, with three exceptions: People in the control group (who are not primed) are more likely to be polygamously married, have lower household consumption expenditure per capita in 2013, and are more likely to have been exposed to idiosyncratic shocks between 2014 and 2016.[15] The magnitude of the difference and the statistical level of the differences are not strong, and we will include these covariates in each regression for the analysis to control for the differences.

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[13] The test includes five questions about mood, one question on the level of irritability, two questions on energy level, one question on concentration, and one item on sleep.

[14] When we test alternative cutoff points in the scale, 8 to 15 percent of our sample is impacted by depression.

[15] Note that when we restrict the sample to observations without missing covariates, the sample is balanced in terms of whether or not idiosyncratic shocks were experienced.

4. Results

To measure the relationship of conflicts, economic shocks, and deaths with depression, we estimate the following regression model:

$$y_{ias} = \alpha + \beta_1 Covariate_{ias} + \beta_2 Idio_{ias} + \beta_3 Death_{ias} + \beta_4 Conflict_{ias} + \beta_5 X_{ias} + \mu_S + \varepsilon_s$$
(1)

where y_{ia} is a dummy variable which equals 1 if individual i reports depressive symptoms (i.e. if the CES-D score is over 10) and lives in enumeration area a. $Covariate_{ia}$ ($Idio_{ia}$) takes a value of one if person i reported experiencing a covariate (idiosyncratic) shock, and 0 if otherwise. Similarly, $Death_{ia}$ takes a value of one if a household member from person i's family had passed away in the past two years, while $Conflict_{ia}$ takes a value of one if a person i experienced a conflict. We control for various individual characteristics in vector X_{ia}, including age, education level, marital status, religion, and household consumption expenditures. We also include state s fixed effects μ_S.

Effect of various adverse events on depression

First, we look at the correlation between any type of negative event -- idiosyncratic shocks, covariate shocks, deaths, and conflicts with our depression measure. Figure 1 shows this relationship visually: the map on the left-hand-side shows a quartile map of the percent of respondents in each state whose family has been affected by any adverse event. The map on the right shows a quartile map of the average CES-D scores in each state; recall that higher scores are associated with higher probabilities of depressive symptoms. Side by side, these maps demonstrate that states where more people experienced any negative incident are also states which have significantly higher CES-D scores.

We find the same trend in our regression results. Table 2, Panel A shows that experiencing any type of adverse event is strongly associated with a higher probability of showing depressive symptoms. Experiencing an incident is also associated with a seven percentage points increased likelihood that one is over the CES-D score cutoff (Table 2 Panel A column 3).

We then examine which types of adverse events are more correlated with levels of depression. Figure 2 shows the mean CES-D score by the type of negative incident experienced. We find that, of all the adverse events, the experience of conflict has the strongest and largest relationship with the respondent's measure of depression. The average CES-D score among respondents who experienced conflict exceeds 10, which is the cutoff point for reporting depressive symptoms. The second highest average CES-D score is among people who experienced idiosyncratic shocks, followed by those with death of family members, then covariate shocks. The depression score among respondents who did not report any incident is the lowest of all the sub-groups.

As before, the regression results presented in Table 2, Panel B support our prior evidence. The experience of conflict in the last two years increases the likelihood of being over the cutoff by 15.3 percentage points. Idiosyncratic shocks have the second largest and significant relationship with depression, as they increase the likelihood of depressive symptomatology by 7.4 percentage points.

Covariate shocks and deaths are not significantly associated with the likelihood of reporting depressive symptoms.

Next, we evaluate how large the effect of each type of event is on depression in monetary terms by comparing their effects alongside the coefficient of consumption expenditures (Table A1).[16] Using our regression specification, we can simulate how much extra consumption a respondent would need (the percentage point change in the depressive measure from consumption over the percentage change from each adverse event) in order to compensate for the effects of each incident on depression.

We find that the effects of idiosyncratic shocks and conflicts on depressive symptoms are equivalent to the loss of 3,852 and 7,914 naira, respectively. In other words, the experience of conflicts would need to be compensated with 7,914 naira (worth around US $52.27) to cancel out its impact on mental health.

Additional correlates of depression

We also examined the correlation of some of individual characteristics with the likelihood of showing depressive symptoms. Our data set is novel in part due to the inclusion of consumption data along with that of mental health and adverse events, and as such, we can control for this. Lower lagged consumption per capita is, as expected, significantly correlated with lower levels of depressive symptomatology. This points to the persistence of well-being and its effect on mental health.

Another finding on significant covariates is notable: Married individuals are less likely to score over the CES-D cutoff than those who are single by about eight percentage points; the coefficient is similar for individuals who are married polygamously.

Impacts of priming on reported depression

In addition to our analysis of the correlates of our depressive measure, we also look at the impacts of the survey experiment. The point estimate for the respondent priming indicator (i.e. respondents who answered questions about their adverse events before answering questions about their depressive symptoms) provides us with the causal impact of this priming. By itself, priming people by asking about their histories of conflicts, deaths, and shocks does not significantly change the likelihood of depressive symptomatology (Table 2 Panel A and B column 3).

We next evaluate the differential effects of negative incidents by the priming "intervention." To do this, we interact the variable for experiencing any adverse event with the priming indicator. We find that the likelihood of being over the cutoff among people who experienced any type of adverse event is higher by 6.5 percentage points if they were exposed to the priming intervention than those who also experienced these incidents but were not primed (Table 2, Panel A, column 4). Priming is particularly impactful on depression for those who reported going through an idiosyncratic shock, as shown in Table 2, Panel B (column 4). The likelihood of being over the CES-D cutoff among people who have experienced an idiosyncratic shock is higher by 8.9 percentage points if they are primed than if they are not primed.

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[16] We calculate the coefficients of each adverse event divided by individualized consumption.

These results indicate that the measurement of depression might be subject to the way a person is asked about mental health symptoms. The priming intervention seems to have served as a reminder about their history of adverse incidents and made them salient for those who had a history. This reminder then caused CES-D scores to increase among those who experienced an adverse event, and, in particular, a personal shock. On the other hand, people who experienced conflicts were not affected by priming. This suggests that these severe events are salient enough that they are always on respondents' minds whether primed or not.

There are a few pathways in which the priming experiment could have impacted the respondents' CES-D scores. As discussed previously, we expect that priming could have made the stimulus of conflicts, shocks, and deaths more accessible to the respondents, thus impacting their state of mind. In this case, the policy implications are such that both the experience of adverse events, and the act of remembering them, are shown to have a relationship with mental health.

It is also possible that measurement error was reduced through priming. By making the adverse effects visible to both the enumerator and respondent, there may have been less of a need for social desirability (e.g. some respondents could more honestly report depressive symptoms because of their past) (Tourangeau and Yan 2007).

On the other hand, having the CES-D questions come later in the survey – i.e., being primed – could alternatively increase measurement error due in part to survey fatigue (Egleston, Miller et al. 2011, Van de Walle and Van Ryzin 2011). To examine the internal reliability of the module we compare the Cronbach's alpha coefficient for the set of CES-D questions between the two groups – priming and non – and find that it is marginally higher for the primed respondents (e.g. those who answered this module later in the survey).[17]

In general, the priming results point to careful consideration when designing future surveys to capture depressive sypmtoms using the CES-D. Careful consideration is required of any potential priming quesitons prior to the CES-D.

Spillover effect of adverse events
Neighbors' experiences with deaths, shocks, and conflicts could also have an impact on one's depression measure. This could be due to a variety of factors: via neighbors' mental health outcomes spilling over into individual mental health, correlation of covariate adverse events and consequent lack of mutual insurance (Fowler & Christakis, 2008; Ray, 1998).

We evaluate the spillover effect of neighbors' experiences on CES-D scores. In particular, we examine the effect of the percentage of neighbors who experienced negative events on one's depressive symptoms (while controlling for personal and household experiences).

First, we evaluate the effect of percentage of neighboring households affected by any type of adversity on one's own likelihood of being over the cutoff (Table 3 Panel A). We find that there

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[17] The overall reliability for the entire sample is 0.76; the Cronbach's Alpha is .7699 for primed, and .7473 for non-primed. The reliability can indicate how well the module measured depressive symptoms, but alternatively could indicate issues such as yay-saying.

is no spillover effect of neighbors' adverse events on one's own depressive measure when one has also had any experience of a negative incident.

Table 3 Panel C then presents the spillover effect of neighbors' experiences with each type of adverse event, disaggregated. If the percentage of neighboring households who experienced an idiosyncratic shock increases from 0 to 100 percent, someone who him or herself did not experience this shows an increase in his or her CES-D score of 0.678 point (Panel C column 1). Similarly, if the percentage of neighboring households who experienced a conflict increases from 0 to 100 percent, someone who did not experience a conflict would see an increase in his or her score of 0.587 point.

On the other hand, if the percentage of neighboring households who experienced the covariate shock increases from 0 to 100 percent, someone who was not impacted by this shows a significant *reduction* of their score by 0.678 point. This result might imply that if the shock affected the community but not one's own household, the respondent may show fewer symptoms of depression due to a combination of mental factors arising from this situation.

One's emotional state might be determined by the relative experience of one's own adverse events to that of others. To test this, we look at the correlations of own experiences interacted with neighbors' negative experiences with the likelihood of depressive symptomatology. We find that if one experiences a death in the household, neighbors' death experiences further increase the likelihood of one reporting depressive symptomatology.

Depression and its connection to welfare outcomes

The results have shown that there are strong correlations between personal and peers' experiences of deaths, conflicts, and shocks, as well as priming of these experiences, with depression measures. We now extend the analysis by exploring the consequences of depression via its economic and societal costs, including correlations with labor supply and on investments in children.

For this estimation, we use the following regression specification:

$$i_{ias} = \alpha + \beta_1 Depression_{ias} + \beta_2 X_{ias} + \varepsilon_s \qquad (2)$$

where i_{ias} is various measurements of individual i, such as activities in the labor market and i's children's schooling and labor activities. X_{ias} includes a vector of individual's characteristics. We cluster standard errors at the state level s.

Endogeneity through simultaneity and reverse causality is a concern under a linear regression approach. The labor market and education outcomes considered in equation 2 can themselves have a direct causal effect on depression. Furthermore, the outcome variables and depression were captured at the same point in time during the survey.

One potential method to attempt to overcome this endogeneity is to identify a suitable instrumental variable and conduct a two-stage least squares (2SLS) estimation. However, we were unable to identify a relevant and valid instrument that plausibly passes the exclusion and restriction criteria (Young 2017). Another way to investigate the reverse causality story is to investigate the link of

current depressive symptoms with lagged outcomes, which we will attempt to do with prior waves of the GHS-Panel. A final method is to construct a control group via propensity score matching. However, there may be systematic differences in outcomes between those affected (by depression) and not, even after controlling for observables. In this case, this would violate the identification conditions for matching.

Unfortunately, we are unable to fully correct for the potential endogeneity. Thus, we frame our findings as a correlation between depression and the considered economic outcomes rather than a causal link.[18]

Regression results in Table 4 show that being over the CES-D cutoff of 10 points reduces the likelihood that one is engaged in any work by 8 percentage points (column 1), in wage work by 2.5 percentage points (column 2), in agricultural work by 4.9 percentage points (column 3), and in non-farm enterprise by 3.5 percentage points (column 4).[19] [20]

The effect of depressive symptoms on labor participation differs by gender (See Table A.1 in the Appendix). Being over the cutoff reduces the likelihood that men are engaged in agricultural work by 8.8 percentage points, while it is not correlated with the reduction in agricultural work among females. Instead, the indicator for depressive symptomology reduces work in non-farm enterprises by 9.6 percentage points; this correlation is not observed among males.

As expected, the experience of adverse events also has a relationship with labor force participation decisions (Table 4). Controlling for depression, the experience of covariate shocks increases the likelihood that one is engaged in any work by 4.4 percentage points, and in non-farm enterprise work by 9.5 percentage points (columns 1 and 4).[21] Conflict is not associated with changes in labor activities.

Next, we investigate the relationship between parents' mental health with children's well-being. Table 4, columns 5 and 6, evaluates how parents' depression status is correlated with investments in children's education. Parental depression is significantly negatively correlated with educational expenditure for children (who are in school) (column 6), while it does not seem to be related to the probability of their children being in school (column 5).

We observe the differential effect of parent's depression on children's educational outcome by children's age. If children are young (11 years old or younger), parents' depressive symptomatology is not associated with whether the child is enrolled in school or not, but it is significantly and negatively correlated with educational expenditures among those who go to

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[18] Despite this, we believe that the story supported by this analysis would not be further supported by the use of quasi-experimental methods.

[19] Note that the relationships between depression and the labor-related outcome variables are negative (results not shown); these negative relationships hold and grow stronger when adding in additional covariates such as adverse events, indicating that they are not necessarily mechanisms.

[20] We find that the measure of depression is not correlated in any significant way with measures of work (both extensive and intensive) from wave 1 of the survey.

[21] In addition to this impact on agricultural work and participation, we find a negative correlation of depression with yields. Because the direction of causality is difficult to determine in this case, we will not discuss this extensively, but results are provided upon request.

school. Conversely, parental depression is associated with reduced school-enrollment rate among children who are 12 to 17, and has no relationship with expenditure for children who are in school (regression results not shown).

Table A3 breaks this further down by gender. Parents' CES-D scores are negatively correlated with a lower probability that 12 to 17-year-old children (particularly males) were enrolled in school. In addition to this decrease in children's human capital, parental depression is associated with lowered educational spending on children. This is particularly true for female children under the age of 12.

These results have an important implication. Parents' depressive symptomatology is negatively correlated with children's school investments. However, it is presumably the case that older children substitute for parents with depressive symptoms to engage in the labor force, while younger children still go to school.

Overall, we find that one's depression is likely to have tangible and striking correlations with the welfare of one's children as well as oneself with regard to labor and education.[22] This leads to a potential storyline, which is that adverse events such as shocks and conflicts may lead to lowered mental health outcomes, which in turn may be negatively correlated with human capital and labor.

5. Conclusion

This study shows that adverse events – and in particular, violent conflicts – are strongly correlated with measures of depression. The analysis also shows that beyond the direct effect of shocks, there is an additional association that comes indirectly through the link between mental health and welfare outcomes: depression is associated with lower labor force participation and lower child educational investments. These correlations hold when controlling for other important covariates such as consumption measures. In light of these results, policy makers need to take into account both the direct and indirect effects that conflicts and depression can have on welfare. Our results are suggestive of costlier individual and societal impacts than previously expected, which means that our idea of welfare impacts must be updated.

These findings suggest that there may be quantifiable economic benefits to improving mental health. Eaton et al (2011) summarize barriers that developing countries face to scale up services for mental health, such as the low priority given to mental health and the scarcity of human and financial resources. Despite these barriers, countries which are particularly vulnerable – those which suffer adverse events – may benefit even more from treating mental health.

More importantly, however, limited evidence makes it difficult to draw comprehensive conclusions on how to replicate successful scaling in developing countries. As such, in this context,

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[22] We do not see a strong pattern of links between adverse events and economic preferences such as time or risk attitudes, suggesting that the most likely pathway is indeed directly via depressive symptoms (results available upon request).

more research is needed in order to help ensure that limited resources are well allocated. Policy makers should consider policies to treat and minimize the effects of depression experienced by victims of shocks, especially conflicts. Previous studies have evaluated the impacts of mental health-related policies, as well as more traditional multi-component, collaborative-care models such as psychotherapy and cognitive behavioral therapy programs. However, to our knowledge, none of these programs improved depression measures for adults in heavy-conflict areas. Thus, there is room as well as a strong need to pursue measures that could reduce depression and its effects for adults in a context such as Nigeria.

Finally, in addition to the main results, our priming results show that while the correlations of adverse events with mental health are clear, the act of thinking about own experiences (particularly if one has suffered from adverse events) in itself is also a potential driver of depressive symptoms. This may mean that careful design of messaging and targeting is relevant in communicating with people in similar contexts.

The priming experiment also shows that we may want to rethink how we structure surveys to minimize measurement error. If priming can impact answers, especially in the context of sensitive topics, then we need to understand exactly how our measures are affected by the order of survey modules. Measuring depression well and in a standardized and cost-effective way will allow policy makers to take the right decisions for their countries' needs. It will also help researchers answer important questions on the correlation between investments and education on the one hand, and conflicts, shocks, and deaths on the other.

One limitation of our study is that it cannot definitively prove a causal link between conflict, depression, and downstream outcomes. Both theory (including existing literature) and the robustness of the empirical analysis suggest that, even if there is partial endogeneity between these factors, the highlighted mechanism is a first-order determinant of outcomes. A natural next step is to rigorously evaluate scalable psychosocial and mental health interventions specifically in the context of fragile and conflict-affected environments.

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Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Mean		Difference
		Total		No Priming	Priming	
Urban	4579	0.41	0.49	0.404	0.415	0.011
Household head	4579	0.74	0.44	0.743	0.731	-0.012
Female	4579	0.37	0.48	0.356	0.375	0.019
Age	4579	50.37	15.67	50.436	50.312	-0.131
Years of education	4579	6.79	5.66	6.752	6.751	0.046
Married	4579	0.74	0.44	0.751	0.736	-0.015
Married (monogamous)	4579	0.57	0.5	0.567	0.572	0.005
Married (polygamous)	4579	0.17	0.38	0.184	0.164	-0.020
Muslim	4579	0.43	0.5	0.422	0.44	0.018
Other or unknown religion	4579	0.02	0.13	0.016	0.018	0.0007
Log per capita consumption in 2012/2013 (annualized average between post-planting and post-harvest data)	4316	11.39	0.705	11.424	11.456	0.032
Hours past week hh non-farm or ag, wage	4579	32.53	24.74	32.704	32.365	-0.339
Household size	4579	5.52	3.19	5.522	5.522	-0.000
Head of HH is female	4579	0.21	0.41	0.214	0.207	-0.007
Head of HH age	4579	53.09	14.62	53.095	53.076	-0.019
Covariate shock 2014-2016	4579	0.17	0.38	0.178	0.167	-0.011
Idiosyncratic shock 2014-2016	4579	0.19	0.39	0.200	0.178	-0.022*
Experienced HH death 2014-16	4579	0.11	0.31	0.115	0.109	-0.006
Conflicts between 2014-2016	4579	0.04	0.19	0.035	0.043	0.008
Experienced shock, conflict, or death 2014-2016	4579	0.36	0.48	0.365	0.346	-0.019
Depressive symptomatology (CES-D Score > 10)	4579	0.22	0.42	0.232	0.216	-0.016
CES-D score (max 30)	4579	7.05	5.19	7.173	6.93	-0.243

Table 2: Correlations of adverse events with depression

	Panel A				Panel B			
	Over CES-D cutoff (>10) for depressive symptoms				Over CES-D cutoff (>10) for depressive symptoms			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Any adverse event	0.105***	0.102***	0.070***	0.038*				
	(0.017)	(0.016)	(0.014)	(0.020)				
Covariate shock 2014-2016					0.028	0.017	0.007	-0.010
					(0.021)	(0.022)	(0.021)	(0.024)
Idiosyncratic shock 2014-2016					0.115***	0.113***	0.074***	0.030
					(0.018)	(0.018)	(0.016)	(0.025)
Experienced HH death 2014-16					0.024	0.014	0.031	0.039
					(0.024)	(0.026)	(0.023)	(0.032)
Conflicts between 2014-2016					0.188***	0.205***	0.153***	0.180***
					(0.038)	(0.037)	(0.034)	(0.046)
Asked about adverse events first (primed)		-0.010	-0.009	-0.036*		-0.012	-0.010	-0.033*
		(0.014)	(0.014)	(0.019)		(0.014)	(0.014)	(0.018)
Priming * Any shock				0.065**				
				(0.027)				
Priming x covariate shock								0.038
								(0.032)
Priming x idiosyncratic shock								0.089**
								(0.035)
Priming x death								-0.019
								(0.042)
Priming x conflicts								-0.049
								(0.066)
Log per capita consumption in 2013		-0.019	-0.033***	-0.034***		-0.018	-0.033**	-0.033***
		(0.013)	(0.013)	(0.013)		(0.013)	(0.013)	(0.013)
N	4579	4304	4224	4224	4579	4304	4224	4224
Fixed effects			X	X			X	X

Notes: Columns 1-4 in Panel A: Ordered logit with clustered standard error (EA), Columns 1-4 in Panel B: Probit with clustered standard error (EA), *** p<0.01, ** p<0.05, * p<0.1. Covariates include urban, household head, female, age, age squared, years of education, marital status, Muslim, "other or unknown religion" and "recently moved or missing EA".

Table 3: Peer effects

	Panel A		Panel B		Panel C	
	Over CES-D cutoff (>10) for depressive symptoms				CES-D Score (0-30)	
	(1)	(2)	(1)	(2)	(1)	(2)
Asked about shocks first	-0.009	-0.009	-0.011	-0.009	-0.034	-0.030
	(0.014)	(0.014)	(0.014)	(0.014)	(0.068)	(0.068)
Any shock	0.071***	0.072**				
	(0.014)	(0.028)				
Covariate shock 2014-2016			0.019	0.054*	0.069	0.215
			(0.021)	(0.031)	(0.103)	(0.157)
Idiosyncratic shock 2014-2016			0.071***	0.050*	0.422***	0.379**
			(0.016)	(0.029)	(0.094)	(0.162)
Experienced HH death 2014-16			0.033	0.079**	0.235**	0.386**
			(0.023)	(0.032)	(0.104)	(0.158)
Conflicts between 2014-2016			0.139***	0.094**	0.606***	0.540**
			(0.037)	(0.045)	(0.196)	(0.236)
%HH with any adverse events	-0.010	-0.009				
	(0.039)	(0.050)				
% HH with Covariate shock in EA (excluding self)			-0.094**	-0.042	-0.695***	-0.503**
			(0.042)	(0.053)	(0.218)	(0.237)
% HH with Idiosyncratic shock in EA (excluding self)			0.077	0.063	0.678**	0.630**
			(0.068)	(0.070)	(0.296)	(0.317)
% HH with Death experience in EA (excluding self)			-0.027	0.026	0.190	0.345
			(0.090)	(0.087)	(0.324)	(0.357)
% HH with Conflicts experience in EA (excluding self)			0.054	-0.031	0.587*	0.456
			(0.067)	(0.089)	(0.317)	(0.410)
Adverse events * %HH with adverse events		-0.003				
		(0.065)				
Covariate shock * %HH with any shock				-0.116		-0.481
				(0.079)		(0.392)
Idiosyncratic shock * %HH with any shock				0.073		0.132
				(0.081)		(0.483)
Death shock * %HH with any shock				-0.326*		-0.950
				(0.177)		(0.707)
Conflict * %HH with any shock				0.205		0.310
				(0.143)		(0.765)
N	4224	4224	4224	4224	4304	4304
Covariates	X	X	X	X	X	X
State fixed effects	X	X	X	X	X	X

Notes: Ordered logit with clustered standard error (EA), *** p<0.01, ** p<0.05, * p<0.1. Covariates include urban, household head, female, age, age squared, years of education, marital status, Muslim, "other or unknown religion" and "recently moved or missing EA".

Table 4: Economic activities and educational investment

	Engaged in any activities (0/1):				Educational investment	
	Any work	Wage	Agriculture	Non-Farm Enterprise	In school	Log (Educational Expenditure)
	(1)	(2)	(3)	(4)	(5)	(6)
						Expenditure > 0
Over CES-D cutoff (>10) for depressive symptoms (0/1)	-0.080***	-0.025*	-0.049***	-0.035*	-0.017	-0.200**
	(0.020)	(0.013)	(0.018)	(0.021)	(0.017)	(0.092)
Covariate shock 2014-2016	0.044***	-0.022	0.029	0.095***	0.009	-0.106
	(0.016)	(0.015)	(0.023)	(0.024)	(0.016)	(0.092)
Idiosyncratic shock 2014-2016	-0.024	0.010	-0.024	-0.050**	0.005	-0.025
	(0.020)	(0.021)	(0.021)	(0.023)	(0.021)	(0.079)
Experienced HH death 2014-16	-0.025	0.026	-0.035	0.007	-0.025	0.017
	(0.021)	(0.018)	(0.023)	(0.027)	(0.027)	(0.108)
Conflicts between 2014-2016	0.042	0.005	-0.034	0.033	0.013	0.198
	(0.027)	(0.030)	(0.041)	(0.046)	(0.044)	(0.337)
Log per capita consumption in 2013	-0.003	0.085***	-0.094***	0.020	0.012	0.562***
	(0.012)	(0.012)	(0.014)	(0.013)	(0.009)	(0.082)
N	4316	4316	4316	4316	4051	2925
r2	0.233	0.110	0.337	0.183	0.150	0.523

Notes: Columns 1-5: Ordered logit with clustered standard error (EA), Column 6: Probit with clustered standard error (EA), *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Covariates include urban, household head, female, age, age squared, years of education, marital status, Muslim, "other or unknown religion" and "recently moved or missing EA".

Figure 1: *Percent whose households have been affected by shocks, conflicts, and/or deaths, on left, or have higher CES-D scores, on right. Darker shades of blue indicate a higher percent of survey participants from within the state who have suffered from these negative incidents, or who have higher CES-D scores, respectively.*
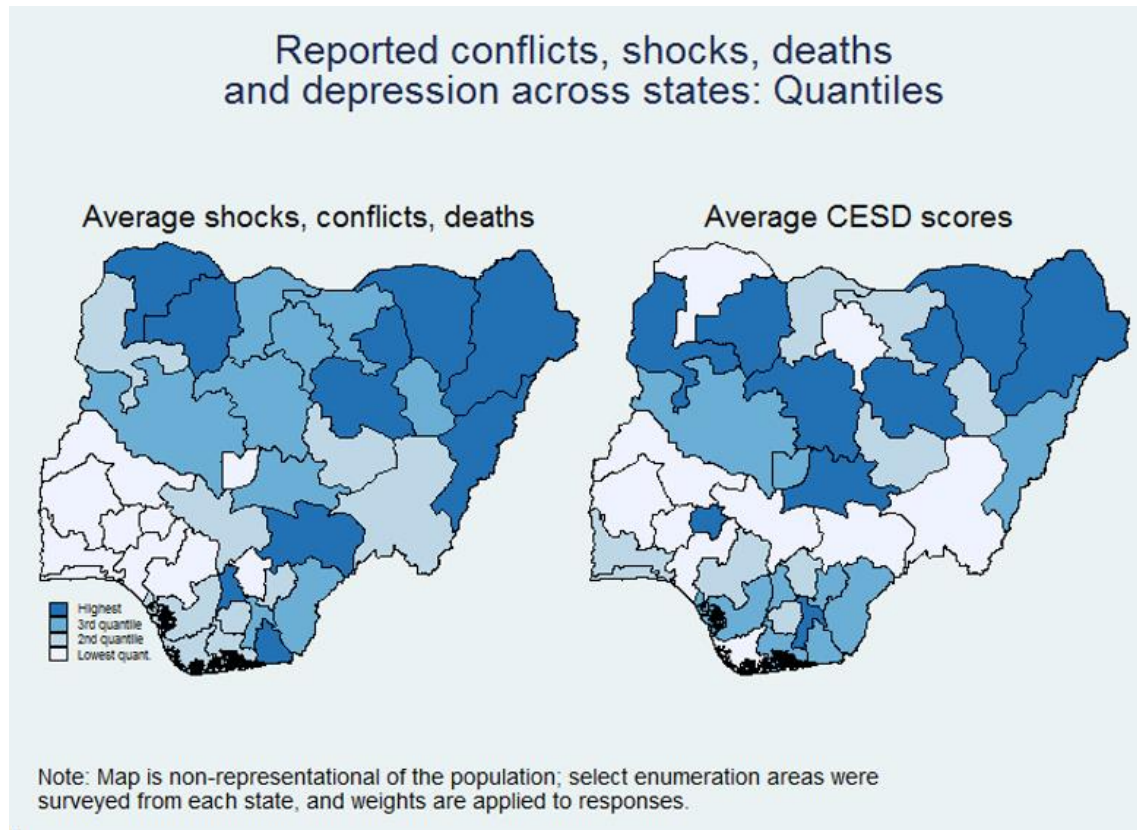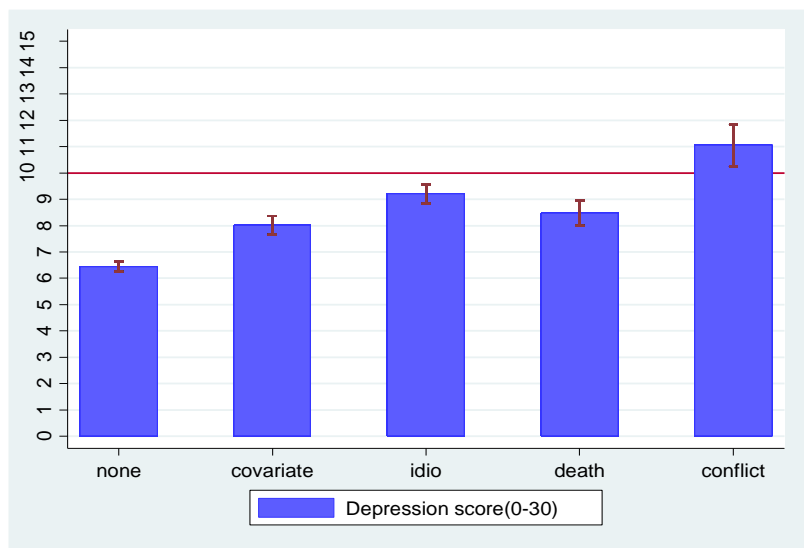
Figure 2: Mean depression score (CES-D) by each type of adverse event.

Table A1:

Appendix 2: Monetary Value of Shock Effect

	(1) Chronically Depressed (0/1)
Covariate Shock/Expenditure	710.749
	(1219.516)
Idiosyncratic Shock/Expenditure	3851.652***
	(959.693)
Death Shock/Expenditure	719.812
	(1399.894)
Conflict Shock/Expenditure	7914.276***
	(1617.896)
N	4224

Table A2: Economic activities by gender

(a) Male

	Any work	Wage	Agriculture	Non-Farm Enterprise
Over CES-D cutoff (>10) for depressive symptoms (0/1)	-0.071***	-0.028	-0.088***	0.013
	(0.019)	(0.020)	(0.023)	(0.027)
Covariate shock 2014-2016	0.046***	-0.018	0.034	0.101***
	(0.017)	(0.017)	(0.025)	(0.027)
Idiosyncratic shock 2014-2016	-0.022	-0.001	-0.039	-0.023
	(0.023)	(0.024)	(0.028)	(0.029)
Experienced HH death 2014-16	-0.023	0.029	-0.030	-0.016
	(0.022)	(0.023)	(0.025)	(0.031)
Conflicts between 2014-2016	0.033	0.026	-0.028	0.021
	(0.029)	(0.038)	(0.047)	(0.050)
Log per capita consumption in 2013	-0.021	0.087***	-0.127***	0.027
	(0.013)	(0.016)	(0.018)	(0.016)
N	2851	2851	2851	2851
r2	0.327	0.117	0.350	0.195

(b) Female

	Any work	Wage	Agriculture	Non-Farm Enterprise
Over CES-D cutoff (>10) for depressive symptoms (0/1)	s	-0.025	-0.007	-0.096***
	(0.033)	(0.023)	(0.024)	(0.033)
Covariate shock 2014-2016	0.011	-0.030	0.018	0.056
	(0.035)	(0.023)	(0.045)	(0.046)
Idiosyncratic shock 2014-2016	-0.007	0.040	-0.006	-0.093**
	(0.042)	(0.032)	(0.030)	(0.041)
Experienced HH death 2014-16	0.032	0.025	0.007	0.097*
	(0.047)	(0.038)	(0.044)	(0.050)
Conflicts between 2014-2016	0.052	-0.009	-0.008	0.036
	(0.058)	(0.043)	(0.080)	(0.081)
Log per capita consumption in 2013	0.008	0.076***	-0.051***	0.004
	(0.020)	(0.016)	(0.017)	(0.023)
N	1465	1465	1465	1465
r2	0.227	0.144	0.349	0.208

Notes: Ordered logit with clustered standard error (EA), *** p<0.01, ** p<0.05, * p<0.1. Covariates include urban, household head, female, age, age squared, years of education, marital status, Muslim, "other or unknown religion" and "recently moved or missing EA".

Table A3: Correlations of parental depression with educational outcomes, by age and gender.

		In school	Log (Educational Expenditure)
		(1)	(2)
Male	<= 11	0.010 (0.016)	-0.273* (0.141)
	12 - 18	-0.071** (0.034)	-0.031 (0.121)
Female	<= 11	0.024 (0.024)	-0.365*** (0.138)
	12 - 18	-0.038 (0.029)	-0.092 (0.170)