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# The effect of armed conflict on intimate partner violence: Evidence from the Boko Haram insurgency in Nigeria

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ABSTRACT

Intimate partner violence (IPV) is the most common form of violence against women in both conflict and non-conflict settings but in conflict settings it often receives less attention than other forms of gender-based violence (GBV), such as conflict-related sexual violence. To examine whether increased rates of IPV are linked to conflict we use data from Domestic Violence module of the Nigerian Demographic and Health Survey (NDHS) collected in 2008 and 2013 and spatially link them to the Boko Haram (BH) actor file of the Armed Conflict Location and Events Database (ACLED). To estimate whether the BH insurgency is associated with increases in IPV we use a quasi-experimental approach, employing a kernel-based difference-in-difference model. We also examine the effect of the BH insurgency on women's likelihood of experiencing controlling behavior from a husband or partner, women's autonomy in household decision-making and their control over their own earnings. We find that the presence of BH increases the probability that women experience physical or sexual IPV by about 4 percentage points after controlling for known correlates of IPV; partner's alcohol use, previous exposure to IPV and condoning IPV as a social norm. Further, we find controlling behaviors from husbands/partners – another form of IPV - are heightened in locations that are impacted by the BH insurgency. In these places women's risk of experiencing controlling behavior increases by 14 percentage points, indicating that the BH insurgency exacerbates another form of IPV; behaviors that are often pre-cursors to physical and sexual IPV. Our results underscore the need for policy makers to prioritize programs that respond to and prevent IPV in conflict affected settings. Effective program responses can be both integrated into sectoral programs and delivered as standalone programs alongside other interventions that provide services to communities living in conflict-affected settings.



## 1. Introduction

Gender-based violence (GBV) experienced in conflict-affected areas varies across settings in terms of prevalence and perpetrator; women and girls bear the brunt of this violence (Wirtz et al., 2014). Rape in war and other forms of conflict-related GBV, including child sexual abuse, and sexual exploitation and their devastating consequences have been documented extensively (United Nations, 2017; United Nations & World Bank, 2018; Vu et al., 2014). High rates of intimate partner violence (IPV) have been recorded in several conflict settings (Global Women's Institute (GWI) & International Rescue Committee (IRC), 2016) but data are limited, and few studies are able to isolate the association between conflict and IPV risk from other IPV risk factors. This study adds to the literature that examines the association between exposure to conflict and IPV controlling for other risk factors using data gathered in Nigeria at the time of the Boko Haram (BH) insurgency. It adds to a small but growing evidence base that underscores the need for interventions that respond to IPV and seeks to transform the norms that legitimize interpersonal violence in conflict-affected settings.

The focus of this paper on IPV is important. IPV is the most common form of GBV[1] in both conflict and non-conflict settings (Georgetown Institute for Women, Peace and Security (GIWPS) & Peace Research Institute Oslo (PRIO), 2017). It is defined by the

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[1] The United Nations (UN) Inter Agency Standing Committee (IASC) defines Gender Based Violence as "an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed differences (i.e. gender) between males and females" (Inter-Agency Standing Committee, 2015). It includes physical, sexual or mental harm and encompasses Intimate Partner Violence (IPV) among others forms of violence.

World Health Organization (WHO) as actions by an intimate partner or ex-partner that result in physical, sexual, or psychological harm, including physical aggression, sexual coercion, psychological abuse and controlling behaviors (World Health Organization [WHO], 2014). Conflicts have been found to increase all forms of GBV (Clark et al., 2010), however IPV is under-reported and often receives less attention compared to sexual violence perpetrated by armed forces (IRC, 2015; Khawaja, 2004; Pittaway, 2005; Stark & Ager, 2011; Vu et al., 2014).

A body of evidence implies that, IPV will hinder recovery from conflict and is a barrier to increasing gender equality and moving people out of poverty. IPV causes physical and emotional traumas which are strongly correlated to poorer physical, sexual, reproductive and mental health outcomes throughout women's lives (Campbell, 2002; Champion & Shain, 1998; Falb et al., 2013; García-Moreno et al., 2013, 2015; Golding, 1999). It is associated with increased drug and alcohol use (Krug et al., 2002), loss of income (Crowne et al., 2011; Lindhorst et al., 2007; Reeves & O'Leary-Kelly, 2007) and negatively impacts child development (Asling-Monemi et al., 2003; Duvvury et al., 2012, 2013; Holt et al., 2008; Klugman et al., 2014; Krug et al., 2002; Raghavendra et al., 2017; Silverman et al., 2009). IPV also feeds the intergenerational transmission of violence, as witnessing IPV as a child or experiencing violence may increase the likelihood of becoming an aggressor or a victim during adulthood (Roberts et al., 2010; Wilkins et al., 2014).

Controlling for differences in individual and household characteristics, we find that BH insurgency is associated with slower progress in reducing women's experiences of physical and sexual IPV. This finding implies that conflict may not always increase the prevalence of IPV but may prevent progress in lowering IPV that could otherwise have been achieved. We also investigate the relationship between conflict and changes in controlling behavior of husbands/partners and changes in women's decision- making autonomy. Controlling behavior of husbands/partners and loss of autonomy are considered forms of IPV in themselves. We find that controlling behaviors of husbands/partners are heightened in locations impacted by the BH insurgency indicating that for women, the BH insurgency is associated with increased risks of another form of IPV, one which is often a pre-cursor to physical and sexual IPV. We find no association between the BH insurgency and women's influence on household decision making or women's control over their earnings.

Our results underscore the need for policy makers to prioritize programs that respond to and prevent IPV. Effective programs combine interventions which seek to end women's economic dependence on men, engage the community through several sectors, and work with multiple stakeholders to challenge harmful and unequal gender norms. Sectors like social protection, education and health can be vehicles through which harmful norms and attitudes are challenged and behaviors are changed (Arango et al., 2014; Ellsberg et al., 2015).

Our findings contribute to two literatures. First, we extend the literature that quantifies the association between conflict and rates of IPV using nationally representative data. In addition, we analyze the association between conflict and indicators of behavior change -- controlling behavior of male partners and women's ability to influence in household decision-making. Controlling behavior is considered a form of IPV in itself as well as a behavior that is associated with increased risk of physical and sexual IPV.[2] To our knowledge this is the first study that has empirically established an association between conflict and this form of IPV. Second, in analyzing IPV we expand the research literature examining the effect of conflict on human development in Nigeria.

We use a quasi-experimental methodology to explore whether conflict has increased the risk of IPV in Nigeria. To estimate the effect of the BH insurgency on IPV we spatially link georeferenced data on conflict events from the Armed Conflict Location and Event Database (ACLED) (Raleigh et al., 2010) with survey data from two rounds of the Domestic Violence (DV) module of the Nigerian Demographic and Health Survey (NDHS) (National Population Commission Nigeria & ICF International, 2009, 2014) collected in the period before and during the BH insurgency, and apply a difference-in-difference approach.

## 2. Background: IPV prevalence in Nigeria and the Boko Haram insurgency

The most recent estimate of IPV in Nigeria based on data from the 2013 NDHS suggests that 16 percent of women have ever experienced physical or sexual IPV (National Population Commission (NPC) [Nigeria] & ICF International [NDHS], 2014), a rate considerably lower than the lifetime prevalence of IPV among ever-partnered women in the Africa region, which stands at 37 percent (García-Moreno et al., 2013). However, IPV rates in Nigeria vary considerably between regions, with the highest rate, 28 percent, occurring in the South-South region (see Fig. 1). Research shows significant ethnic and geographical differences in the likelihood of experiencing IPV (Linos et al., 2013; Nwabunike & Tenkorang, 2017) and that rates of IPV differ between religious and cultural groups[3] (Antai & Antai, 2008; Odimegwu & Okemgbo, 2003). IPV is still widely condoned in Nigeria with 35 percent of women and 25 percent of men believing a husband is justified in beating his wife[4] (NDHS, 2014).

Between 2008 and 2013, a time period that corresponds to the onset of the BH insurgency, the national rate of IPV fell from 18 to 16 percent. However, this progress was uneven and in two regions, North East, and South West, IPV prevalence rates increased. During this time the BH insurgency was focused in northeastern Nigeria so the increased rates IPV could be associated with conflict but equally could be driven by other factors that create variation in IPV prevalence rates in different locations in Nigeria. Our paper examines whether the conclusion that conflict has led to increased IPV can be supported by research based on analysis of the DHS data. We set out below some background to the conflict and identify the locations where communities were most impacted.

Boko Haram (BH) carried out its first known terrorist activity in the northeastern state of Borno, Nigeria in 2009.[5] The insurgency is responsible for large scale forced migration and an unprecedented regional and humanitarian crisis (Read, 2017).[6] BH's activities were

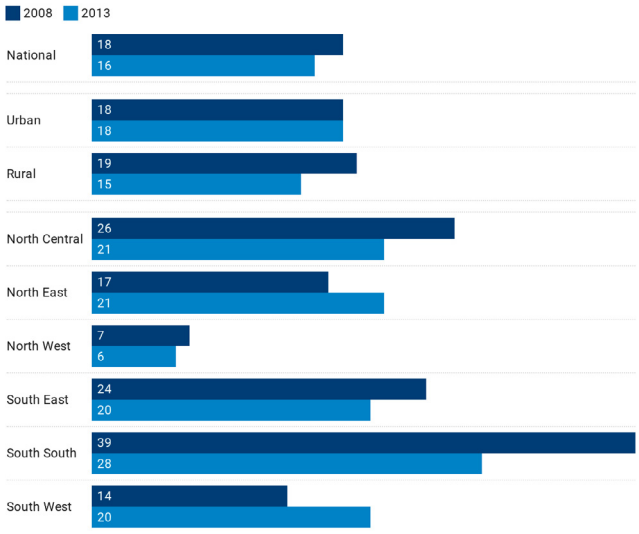
[2] See WHO & PAHO (n.d.) Intimate Partner Violence. Forms of intimate partner violence include "Controlling behaviours, including isolating a person from family and friends; monitoring their movements; and restricting access to financial resources, employment, education or medical care." https://apps.who.int/iris/bitstream/handle/10665/77432/WHO_RHR_12.36_eng.pdf.

[3] Ethnicity is often used as a proxy for culture because it entails social norms that determines behaviors as well as the gender roles and power dynamics within the household and community as well as women's contribution to household decision-making (Oyediran & Isiugo-Abanihe, 2005).

[4] Reasons include, arguing with him, refusing sex, burning the food, neglecting the children, or going out without telling him.

[5] Armed Conflict Location & Event Data Project (ACLED). https://www.acled-data.com/, accessed March 10, 2018.

[6] As of October 31, 2018, the UNHCR reports 231,474 Nigerian refugees in the region. Of these, 51% were in Niger while 44% and 5% of refugees were in Cameroon and Chad respectively. Most of the Nigerian refugees in Cameroon (98%) were in the far North and displaced by the BH insurgency (UNHCR, 2018). It was also reported that 2,421,372 Internally displaced persons (IDPs) were in the region. Of these 80% were in Nigeria while 9% and 7% were in Cameroon and Chad respectively and 4% in Niger. All the IDPs in Chad and Niger and 94% of those in Nigeria were displaced by the BH insurgency. https://data2.unhcr.org/en/situations/nigeriasituation#_ga=2.136643888.1888885269.1543034189–138741330.1543034189, accessed October 31, 2018.




Source: Nigeria Demographic and Health Survey (NDHS, 2009, 2014).

**Fig. 1.** Women who have ever experienced physical or sexual violence by a husband or partner in Nigeria, by location and region, percent. Source: Nigeria Demographic and Health Survey (NDHS, 2009, 2014).

initially focused mostly in northeastern Nigeria but from 2014 onwards its terrorist activities spread to the neighboring countries of Cameroon, Chad and Niger (United Nations High Commissioner for Refugees [UNHCR], 2018). Between 2009 and 2017, the Armed Conflict Location and Events Database (ACLED) reports 2,378 conflict events with BH as an actor[7] occurred across Nigeria; most of these events (about 70 percent) occurred in Borno State in North East Nigeria. In January 2017 an estimated 1.8 million people, mostly women and girls, in northeastern Nigeria, needed protection from GBV (UN Office for the Coordination of Humanitarian Affairs [UNOCHA], 2018).

ACLED records the location of conflict events with BH actors. We use the data for 2009–2013, the time period that coincides with the DHS data collected on IPV prevalence rates used in the study. During this period, there were a total of 799 BH events. By far the most affected area was the northeastern state of Borno where over 60 percent of all BH events (483 out of 799) were recorded in this time period (see Figs. 2 and 3).

It is widely reported that conflict-induced displacement and violence associated with the BH insurgency have exacerbated violence against women (Read, 2017; UNOCHA, 2017). The BH insurgency has been consistently associated with territorial control, forced recruitment, hostage taking and violence against women and girls as well as men and boys (Nagarajan, 2017). BH is notorious for employing various tactics for terrorizing communities.[8] In February 2014, fifty nine boys were killed at a Federal Government College in Buni Yadi, Yobe State by BH and girls were ordered to leave school and get married (Hemba, 2014). A few months later, in April 2014, over 200 school girls were abducted in Chibok, Borno state with BH insisting that the education of the girl child is taboo (Simonelli et al., 2014). In February 2018, BH was also responsible for the abduction of 110 school girls in Dapchi, Yobe State.[9] In the four years after the abduction of the Chibok school girls UNICEF estimates that more than 1,000 children were abducted by BH.[10] Men and boys have been indiscriminately targeted and have fled their families because of the risk of being recruited by BH or killed by law enforcement (Dietrich, 2015).

Increases in IPV associated with the BH insurgency have become a matter of deep concern (IRC 2017; UNOCHA 2018). Women in communities affected by the BH insurgency report increased arguments and violence within the home, and sometimes ultimately abandonment by their partners. They often attribute abandonment to the inability of a male partner to provide for his family and his frustration with being unable to do so (Nagarajan, 2017). For men, living in conflict-affected situations makes it difficult to comply with traditional social norms surrounding masculinity, for example to be in control of property, land, income, their lives and the lives of their families in general and so leads to increased stress and depression (International Rescue Committee, 2012; Slegh et al., 2014; Women's Commission for Refugee Women and Children, 2005) which are risk factors for the perpetration of IPV (Clark et al., 2010; Hanmer & Klugman, 2016).

The BH insurgency is also associated with changing marriage practices and incentivizing early marriage, the latter a risk factor for experiencing IPV. Women and girls have been coerced or persuaded into BH with promises of religious knowledge, or a higher social position than that accorded to them by their communities, or to reduce their families' financial burdens through their marriage to BH members (Nagarajan 2017). In some communities BH eased the cost of marriage ceremonies by sponsoring them and ordered the payment of bride price is made to the bride instead of her family thereby incentivizing brides to marry early. Reports document that families in BH affected areas arrange early marriages for their daughters both to reduce pressure on household resources (Campagne & Begum, 2017) and in exchange for protection (International Crisis Group, 2016).

## 3. The impact of armed conflict on IPV: Conceptual framework and evidence

How does armed conflict translate into increased risk of violence perpetrated by an intimate partner? This section applies the ecological framework to the evidence on the impacts of BH insurgency and other conflicts on individuals and communities to identify potential causal pathways to increases in IPV and discusses the factors that have emerged as predictive in the research to date.

The ecological framework is often used to understand the causes of intimate partner and other forms of gender-based violence by public health bodies (see for example Centers for Diseases Control and Prevention, 2020; World Health Organization [WHO] & London School of Hygiene and Tropical Medicine, 2010). Heise (1998) pioneered using the ecological framework to establish factors that emerge as predictive of violence against women and it is now widely used in research (Abramsky et al., 2016; Breiding et al., 2014; Capaldi et al., 2012; Fulu & Heise, 2015; Garcia-Moreno et al., 2006; Heise et al., 1999; Heise, 2015; Javalkar et al., 2019; Kiss et al., 2012, 2012; Kyegombe et al., 2014; Michau et al., 2015; Starmann et al., 2017; Stöckl et al., 2011; Vyas et al., 2015; Vyas & Heise, 2016; Walker, 2006; Widom & Wilson, 2015; Yüksel-Kaptanoğlu et al., 2012).

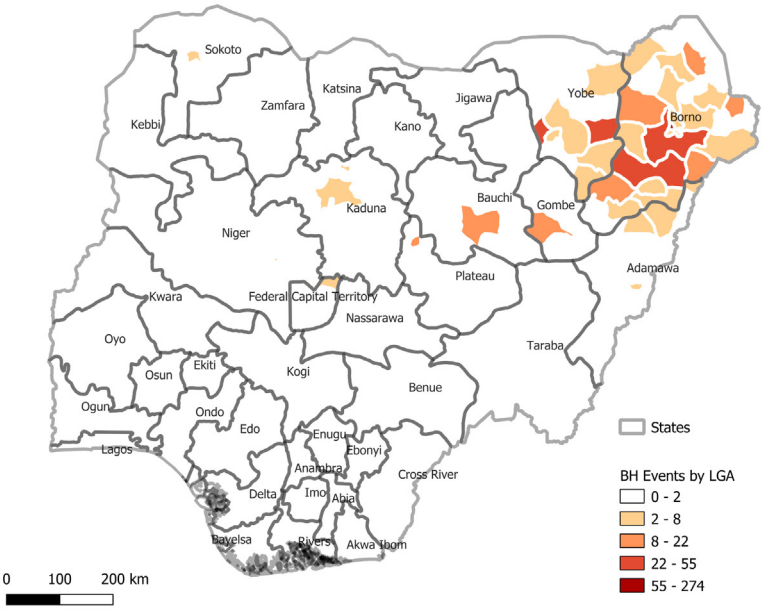
We use the ecological framework as it provides a way to understand how changes at the community level such as exposure to

[7] BH events in the ACLED are defined as any incidents including riots, clashes, protests, riots or battles where BH is an actor.

[8] United Nations (2016); Amnesty International estimates that more than 2,000 women and girls were abducted by Boko Haram between 2009 and 2015, many of whom were forced into marriage with Boko Haram fighters (Amnesty International, 2015).

[9] Aljazeera (2018).

[10] UNICEF (2019).




Source: Authors own calculation using data from ACLED BH actor file and Nigeria Local Government Area (LGA) shape files from the Database of Global Administrative Areas – GADM.

**Fig. 2.** Boko Haram events by Local Government Areas (LGAs) in Nigeria, 2009 – 2013 Source: Authors own calculation using data from ACLED BH actor file and Nigeria Local Government Area (LGA) shape files from the Database of Global Administrative Areas – GADM.

conflict and occurrences of conflict events, can impact factors that create IPV risk for women. The ecological framework conceptualizes violence as a multi-dimensional phenomenon, based on the complex interplay between factors related to violence against women at different levels of the social ecology. It posits no one factor "causes" violence but rather that violence is more or less likely to occur as factors interact at different levels of the social ecology.

| North East | 2009 | 2010 | 2011 | 2012 | 2013 | Total |
|---|---|---|---|---|---|---|
| Borno | 11 | 28 | 80 | 166 | 198 | 483 |
| Yobe | 6 | 3 | 9 | 56 | 26 | 100 |
| Bauchi | 2 | 3 | 7 | 12 | 2 | 26 |
| Adamawa | 0 | 0 | 3 | 10 | 9 | 22 |
| Gombe | 1 | 0 | 1 | 8 | 3 | 13 |
| Taraba | 0 | 0 | 0 | 2 | 1 | 3 |
| **North West** | 2009 | 2010 | 2011 | 2012 | 2013 | Total |
| Kano | 1 | 0 | 2 | 41 | 21 | 65 |
| Kaduna | 0 | 0 | 1 | 27 | 5 | 33 |
| Sokoto | 0 | 0 | 2 | 4 | 1 | 7 |
| Jigawa | 0 | 0 | 0 | 1 | 1 | 2 |
| Katsina | 0 | 1 | 1 | 0 | 0 | 2 |
| **North Central** | 2009 | 2010 | 2011 | 2012 | 2013 | Total |
| Plateau | 0 | 2 | 5 | 6 | 0 | 13 |
| Niger | 0 | 0 | 4 | 5 | 0 | 9 |
| FCT | 0 | 0 | 4 | 3 | 1 | 8 |
| Kogi | 0 | 0 | 0 | 5 | 0 | 5 |
| Nasarawa | 0 | 0 | 0 | 1 | 1 | 2 |
| Benue | 0 | 0 | 0 | 1 | 1 | 2 |
| **South** | 2009 | 2010 | 2011 | 2012 | 2013 | Total |
| Lagos | 0 | 0 | 0 | 2 | 0 | 2 |
| Enugu | 0 | 0 | 0 | 1 | 0 | 1 |
| Edo | 0 | 0 | 0 | 1 | 0 | 1 |

Source: Authors own calculation using data from ACLED BH actor file.

**Fig. 3.** BH events by state and year in Nigeria, 2009 – 2013 Source: Authors own calculation using data from ACLED BH actor file.

The social ecology consists of personal history, the microsystem, the exosystem, and the macrosystem. Personal history refers to individual experiences that determine one's response to microsystem and exosystem stressors. The microsystem represents the immediate context in which the abuse takes place, in the case of IPV, the relationship with the partner, the exosystem refers to both formal and informal social structures that affect one's environment and influences what happens there and, the macrosystem represents general views and attitudes that permeate culture at large (Heise, 1998).

Conflict triggers changes in the social ecology at the individual level (microsystem) and in formal and informal social structures (exosystem). At the individual level, evidence suggests that men and women respond differently to the high levels of psychological stress experienced due to conflict. For example, a study on conflict-affected areas of the Democratic Republic of Congo (DRC) found that men tend to cope with extreme stress and trauma using strategies that seek to avoid and reduce feelings of vulnerability, including alcohol and substance abuse, behaviors commonly associated with increased perpetration of IPV, while women more frequently seek some form of help or turn to religion (Slegh et al., 2014).

Conflict can also alter individual behaviors in other ways. Personal violence outside the home may spill over into relationships with intimate partners, as disputes and disagreement often escalate into violence and abuse — potential triggers for increased rates of IPV (Kiss et al., 2015). The breakdown of law and order,

or social support and safety systems such as the extended family or village groups (exosystem factors) may also reduce protective factors that, at the individual level, allow intervention and prevention of IPV (Clark et al., 2010; Horn, 2010). In the case of Boko Haram, another channel through which the conflict affects an individual's risk of experiencing IPV is through their influence on marriage practices. Increased rates of child and early marriage to Boko Haram insurgents has meant that some women and girls have had little choice about marrying a potentially violent partner and often have no option but to remain in the marriage (IRC, 2012; Wirtz et al., 2014).

Frequently conflict creates barriers to employment and so men may find it difficult to fulfill the traditional role of male breadwinner and protect the family. As a corollary, women's labor market participation often increases in conflict settings and the income they generate becomes more important for family welfare. These types of changes in the gender division of labor can threaten masculinity and are often associated with increased use of violence by men (Buvinic et al., 2013; Justino, 2017). For example, a study of DRC found that for men, work and income are central to their identities, and the loss of either seems to have serious consequences in terms of mental health with both men and women reporting lack of work and income as a trigger for men's use of violence (Slegh et al., 2014).

The few studies that have empirically examined the effect of conflict on IPV find a positive correlation. Kelly et al. (2018) find that residing in a conflict fatality-affected district in Liberia was associated with a 50 percent increase in the risk of IPV compared to residing in a district where there were no conflict-related fatalities. Gutierrez & Gallegos (2016) examine the effect of women's exposure to the internal conflict in Peru in childhood and teenage years on the likelihood that they will perpetrate or experience domestic violence in their marriages as adults. They find female exposure to conflict increases their later risk of being both a perpetrator and a victim of IPV. Also, women exposed to more conflict events are more likely to justify violence against women and stay in a violent relationship. Østby (2016) combines subnational data on armed conflict events with individual-level data on partner abuse from DHS surveys in 17 Sub-Saharan African countries and finds that the intensity of armed conflict in the home region has an independent and significant effect on women's risk of experiencing sexual IPV. Finally, Falb et al. (2013) examine the effect of conflict on past-year IPV among refugee women affected by the conflict in Burma (Myanmar). They find that women who experienced conflict victimization[11] were six times more likely to report past-year IPV than women who had not experienced conflict victimization.

Results from other studies are consistent with the hypothesis that the impact of conflict on communities spills over to change individual behaviors within the household. Saile et al. (2013) examine the prevalence and predictors of current partner violence experienced by women in post-conflict Uganda. The authors suggest that women's prior exposure to war-related traumatic events as well as men's level of alcohol-related problems were associated with higher levels of IPV. Gupta et al.'s (2012) study of South Africa during apartheid found an association between experiencing a major human rights violation and victimization of close friends or family members and with men's perpetration of physical IPV. Clark et al. (2010) examine the effect of political violence on female experiences and male perpetuation of IPV in Palestine and find that political violence is related to higher risk of experiencing IPV for women. Specifically, the direct exposure of a husband to political violence was associated with 89 percent higher odds of a wife reporting physical violence, and 123 percent higher odds of reporting sexual violence compared with women whose husbands were not directly exposed to political violence. Similarly, Gupta et al.'s (2009) study of male immigrants to the USA found that exposure to political violence in their country of origin increased their likelihood of perpetrating IPV.

Qualitative studies have shed more light on the interactions between factors at different levels of the ecological framework, pointing to causal pathways and showing a more nuanced dynamic. For example, using focus groups, Horn et al. (2014) explore women's perceptions of the causes of IPV in conflict settings in Sierra Leone and Liberia. Their findings suggest that the increased use of violence by some men was driven by the normalization of violence as a way of responding to frustrations and challenges. However, the war also resulted in women becoming economically active, which in this case decreased IPV, as the pressure on men to provide for their families reduced. Also, economic independence and interventions provided women with the option of leaving a violent relationship.

## 4. Data and model specification

### 4.1. Data and sample construction

Data are drawn from the Domestic Violence (DV) modules of the 2008 and 2013 Nigerian Demographic and Health Surveys (NDHS) which sample 23,752 and 27,634 women, respectively.[12] The NDHS includes information on the location of the interview and its GPS coordinates. The 2008 NDHS provides data for the period before the BH insurgency while the 2013 NDHS provides data for the period during the BH insurgency. Exposure to BH is measured using the Armed Conflict Location and Event Database (ACLED) which records the date, location, and type of events whether they generate fatalities or not.

The NDHS is representative at the state level and our sample is made up of NDHS data drawn from across all 36 States as well as the Federal Capital Territory (FCT).[13] The NDHS observations from both surveys are linked to the BH events recorded in ACLED using GPS coordinates.[14] To match the timing of the NDHS surveys, we use geocoded BH events that occurred between 2009 and 2013.[15] During this period 799 BH events in Nigeria are recorded in ACLED. As we exploit variations in the timing and location of BH events, observations in the 2008 NDHS from two areas[16] not surveyed in the 2013 NDHS due to the intensity of the BH insurgency are excluded from our analysis.

[11] Falb et al., (2013) describe conflict victimization as "targeted violence against civilian women, including sexual violence which is seen as a "tactic of war" and associated with a range of negative outcomes, including poor mental health stigma, isolation, and shame; and increased vulnerability to HIV and other sexually transmitted infections".

[12] The NDHS is a nationally representative cross-sectional household survey that provides data on population, health, and nutrition for women aged 15–49.

[13] In Nigeria, Local Government Area LGA's are smallest administrative area. There are 774 LGA's across 36 states and the Federal Capital Territory (FCT).

[14] The EAs are areas selected by the DHS for every round of the DHS survey for data collection purposes. The DHS is neither representative at the EA or LGA level. GPS points are provided for DHS clusters (DHS clusters further disaggregate EAs), so there are multiple clusters withing an EA and multiple EAs within an LGA. The definition of the affected area is given by the number of conflicts within the 10 km of the DHS cluster a woman resides – this does not need to be representative; it is enough that it provides enough heterogeneity of conflict exposure for the interviewed women.

[15] Because the ACLED often reviews specific periods of conflict to ensure accuracy, there may be changes to the data in selected countries or targeted conflicts throughout the year. The ACLED data used for the analysis in this study was downloaded from www.acleddata.com on 30th August 2018.

[16] Maidugiri in Borno State and Damaturu and Nangere in Yobe State.

### 4.2. Outcome variables

The 2008 and 2013 NDHS follow international global standards for the measurement of intimate partner violence.[17] To measure experience of physical or sexual IPV, ever-partnered women are asked if they ever experienced certain behaviors from their husband/partner including pushing, slapping, arm twisting, punching, kicking, choking, attacking with weapon, forceful sexual intercourse, and forceful performance of other sexual acts. Because we exploit the timing and location of IPV in the BH affected area, our analysis focuses on women's experiences of physical or sexual IPV in the year preceding the survey – commonly taken to mean that women are currently experiencing violence (Abramsky et al., 2011). Using this information, we create a dichotomous variable measuring past year physical or sexual IPV, which equals to 1 if a woman answers yes to experiencing any behaviors defined as physical or sexual IPV from her husband/partner in the past 12 months and zero otherwise.

Experience of controlling behavior and loss of autonomy have been categorized as forms of violence in themselves and are often precursors to or key drivers of physical and sexual IPV (Aizpurua et al., 2017; Antai, 2011; McCarthy et al., 2018; Tenkorang, 2018). We use information on men's controlling behaviors and women's autonomy in decision-making to examine whether these key drivers of IPV are affected by the BH insurgency. To determine if a woman experiences controlling behavior of her husband/partner, we create a variable which equals to 1 if a woman answers yes to any of the following questions: does her husband/partner - get jealous when she talks to other men; accuse her of unfaithfulness; not permit her to meet female friends; limit her contact with family; or, insist on knowing where she is at all times - and zero otherwise. Women's household decision-making autonomy is measured by an index that ranges from 0 to 3, corresponding to the number of household decisions which she takes solely or jointly with her husband/partner. The three decisions are: her ability to decide to access health care services for herself; her ability to make decisions about major household purchases; and, her ability to decide when to visit her family or relatives. A higher score indicates a higher level of empowerment (NHDS, 2014). To determine earnings decision-making autonomy, the variable is equal to 1 if a woman who earned cash for work in the 12 months preceding the survey makes decisions alone or jointly with her husband/partner and zero otherwise.

### 4.3. Exposure to the BH insurgency

Exposure to conflicts is defined in different ways in the literature. It can be defined as residence in administrative areas with conflict events (Akresh et al., 2012; Ekhator-Mobayode & Abebe Asfaw, 2019) or as residence within specified buffer zones (predefined radius) around conflict events. For example, in mapping the number of children affected by conflict in affected countries, Bahgat et al. (2018) use a buffer zone of 50 km arguing that it is a reasonable distance within which conflict events could impact people's lives. In contrast, Chukwuma and Ekhator-Mobayode (2019) employ smaller buffer zones--between 3 km and 10 km radius—to analyze the impact of the BH insurgency on access to maternal health services in Nigeria based on catchment area for access to health centers. Similarly, Howell et al. (2020) use buffer zones of between 2 km and 10 km to examine the effect of conflict on child nutrition and mortality in Nigeria. In this paper, we define exposure to the BH insurgency as residence within a 10 km radius of any BH event during the study period (Fig. 4). We chose a smaller exposure zone, rather than a Local Government Area or a larger zone as recent research in BH affected states found that the experiences of women and girls were greatly dependent on BH activities in their localities (Nagarajan, 2017). We find that 11 percent of the women in our sample lived within 10 km of any BH event both before and during the BH insurgency. These are the women that make up the treatment group in our study.

### 4.4. Control variables

A body of research shows that factors affecting the risk of experiencing IPV such as education, socioeconomic status, formal marriage, alcohol abuse, cohabitation, age, condoning IPV and witnessing IPV as a child are common across several country settings (Abramsky et al., 2011; Hanmer & Klugman, 2016; Heise, 2011; Klugman et al., 2014). As noted above controlling behavior is considered a form of IPV. There is less research on factors affecting controlling behavior in the social science literature. A number of studies focus on men's controlling behavior as a risk factor for male perpetration of IPV (Fleming et al., 2015; Fulu et al 2013; McCarthy et al, 2018) and a body of research examines the link between women's experience of controlling behavior and their risk of IPV. Other research (Antai, 2011; Wandera et al., 2015) that examines controlling behavior as an outcome includes determinants that are listed above as control variables. Some risk factors may be culturally specific or specific to particular social groups within countries. In the case of Nigeria research shows rates of IPV vary between regions and religious and cultural groups (see section 2) so we include religion and ethnicity as Nigeria specific control variables. We classify covariates as follows: individual characteristics; partner characteristics; household characteristics; attitudes towards and experiences of IPV; and, Nigeria specific factors. (Table 1).[18]

### 4.5. Model specification

We test the hypothesis that, in the absence of the BH insurgency, changes in the rates of IPV before and during the BH insurgency would have been the same in the BH-affected areas and in areas unaffected by BH (hereafter non-BH areas). To estimate the effect of the BH insurgency on women's experience of IPV, we specify the following difference-in-difference (DD) model.

$$IPV_{ily} = \beta_0 + \beta_1 DuringBH_y + \beta_2\ BHArea_l + \beta_3\ DuringBH_y * BHArea_l + \beta_4 X_{ily} + \varepsilon_{ily} \quad (1)$$

The DD model exploits the variation in timing and location of the BH insurgency. This allows for the avoidance of biases from comparisons of IPV rates before and during the insurgency that could be the result of factors other than BH attacks. The unit of observation for Eq. (1) is a woman. $IPV_{ily}$ is the outcome variable indicating if a woman $i$, interviewed in an area $l$, and NDHS year $y$, experienced IPV. $DuringBH_y$ is a binary variable indicating the

[16] Maidugiri in Borno State and Damaturu and Nangere in Yobe State.

[17] The NDHS uses a modified version of the Conflict Tactics Scale (Straus, 1979; 1990) which consists of a series of individual acts of physical and sexual violence. The modified list only some of the acts of physical and sexual violence (see appendix section A1). If a woman confirms that any one of the specified acts or outcomes has taken place, she is considered to have experienced physical or sexual violence. By asking separately about specific acts of violence, the NDHS measure of physical or sexual violence using the modified CTS approach is not affected by different perceptions of what constitutes violence by women (Kishor & Johnson, 2006). Kishor and Johnson (2006) state that *"for example, a woman has to specify if she was ever "slapped," not whether she has ever experienced violence. All women would probably agree what constitutes a slap, but what constitutes a violent act or what is understood as violence may vary among women and across cultures."*

[18] We do not include factors such as controlling behavior of husband/partner and indicators of women's empowerment / agency as covariates because these factors are jointly determined with IPV and thus endogenous.

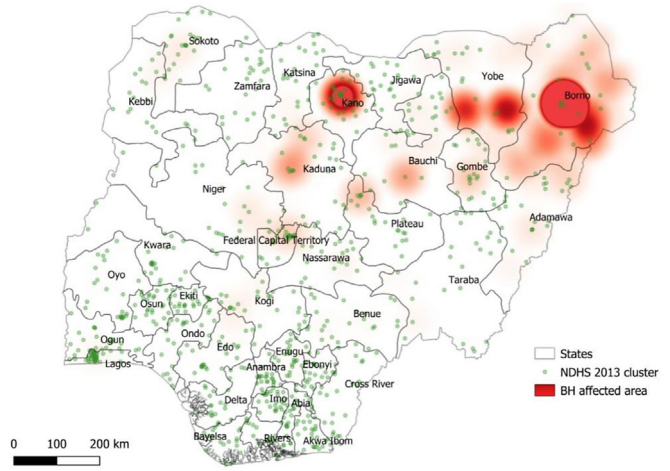



**Fig. 4.** BH attacks between 2009 and 2013 occurring within 10 km of communities surveyed by the Nigeria Demographic and Health Survey. Source: Authors own calculation using data from ACLED BH actor file, Nigeria LGA shape files from the Database of Global Administrative Areas (GADM) and the Nigeria Demographic and Health Survey (NDHS, 2009, 2014).

**Table 1**
Variables used in the analysis.

| | |
|---|---|
| A. IPV | |
| 1. Past year physical or sexual IPV | Woman experienced physical or sexual IPV in the 12 months preceding the NDHS. |
| B. Drivers of IPV | |
| 1. Controlling behavior by husband/ partner | Woman's husband/partner exhibits any control issue$^{\alpha}$. |
| 2. Women's household decision- making autonomy index | Number of household decisions made alone or jointly with husband/partner |
| 3. Women's earnings decision-making autonomy | Woman decides how her earnings are spent alone or jointly with husband/partner. |
| C. Covariates | |
| Individual characteristics | Age in years $^{\beta}$; Education $^{\beta}$; Employment status $^{\beta}$; Type of earnings$^{\gamma}$; Total number of children born; Married as a child; Headship status |
| Partner characteristics | Age in years $^{\beta}$; Education $^{\beta}$; Employment status $^{\beta}$; Sometimes or often drunk |
| Household characteristics | Polygamous household; Household size $^{\beta}$; Location $^{\beta}$ (rural/urban); Wealth. $^{\beta}$ |
| Attitudes and experiences of IPV | Father beat mother; Condones wife beating |
| Nigeria specific factors | Culture proxied by ethnicity, religion, and state dummies capturing differences in socio-economic conditions between states |

Note: $\alpha$ defined as answering yes to whether a husband/partner gets jealous when she talks to other men, accuses her of unfaithfulness, does not permit her to meet female friends, limits her contact with family or insists on knowing where she is at all times. $\beta$ denotes variables used in the matching stage. $\gamma$ the NDHS collects information on the type of earnings received by women age 15–49 employed in the 12 months preceding the survey. Women are asked whether they have worked in agriculture or on family land or in small businesses or sold goods. Answer options include payment in cash, cash and in-kind, in-kind only, and not paid.

NDHS year the woman was interviewed. It is 1 for observations from the 2013 NDHS during the BH insurgency and 0 otherwise. $BHArea_l$ indicates whether the woman resides in a BH affected area. It is a binary variable equal to 1 if the woman resides within a 10 km radius of any BH event between 2009 and 2013 and 0 otherwise. The covariates listed in Table 1 are represented by $X_{ily}$. Finally, $\varepsilon_{ims}$ is the stochastic error term.

The parameter of interest, $\beta_3$, measures the average treatment on the treated. It is the effect of the BH insurgency on women's experiences of IPV, as measured by the change in IPV between BH affected areas and non-BH areas before and during the BH insurgency. In other words, it estimates the effect of the presence of the BH insurgency on IPV in the BH affected areas.[19]

### 4.6. Estimation bias

In standard DD models, there are two common causes of estimator bias. First, selection bias across time and groups (Stuart et al., 2014). Second, using data from repeated cross sections as opposed to longitudinal data can cause estimates to be biased due to terms that must remain unchanged to ensure before-after comparability (Blundell & Costa Diaz, 2009). For our model, selection bias across time could occur if the composition of the sample in the BH and non-BH affected areas changes in the period before and during the BH insurgency due to the BH insurgency. Alternatively, selection bias across groups could occur if the composition of the sample changes across the BH and non-BH affected area. Population movements to and from the BH affected area because of the operations of law enforcement and flight from the conflict could for example, affect the composition of the sample in the BH affected area before and during the BH insurgency. This is especially a concern because although the 2013 NDHS reports the woman's location of residence at the time of the survey, information about any previous location and reasons for relocation is not collected which means that information about migration due to the BH insurgency is not available from the survey. For our analysis, this could mean selection bias both across group and time. We address these potential sources of bias as follows. First, as discussed in Section 4.1, we exclude from our analysis observations from the 2008 NDHS from areas not surveyed in the 2013 NDHS on the account of the BH insurgency to ensure before-after comparability. Second, we employ a kernel-based propensity score matching (PSM) method to ensure that the profile of women in BH areas and non-BH areas are similar based on observables.

The PSM method estimates each woman's propensity for residing in the BH-affected area during the period of the BH insurgency using a kernel density function. Each of the three control groups (women who reside in the BH area in the period before the BH insurgency, women who reside in the non-BH area before the insurgency and women who reside in the non-BH areas after the BH insurgency) are then matched to the sample of women who reside in the BH area in the period during the BH insurgency. The study sample is thus matched on individual characteristics of the women and their partners using the following variables age; education; and employment status; household size, type of settlement (urban versus rural); and household wealth status[20] (see appendix section A2 for kernel-based matching results). Eq. (1) is then estimated on the common support of the matched sample. The common support is composed of the sample of women who reside in the BH area for whom counterfactuals are found in each of the three control samples. The method weights each of the individual observations in the three control groups based on propensity scores, creating a balanced control group that does not differ systematically from the treated group on observables. The balanced sample is then used to estimate the average treatment effect of residing in the BH area dur-

[19] We also check if the intensity of exposure to BH may affect the likelihood of increased IPV beyond residing in an area where the BH insurgency is present i.e. we determine the marginal effect of BH events in the BH affected area, by accounting for the number of BH events in the affected area within the study period. The results are reported in Appendix section A3. We find that each additional BH event has no significant effect on the outcome variables, except in the case of earnings decision-making autonomy where the impact is an increase of less than 0.1 percentage points. This is likely because we do not have observations from the areas of the country where the largest number of BH attacks took place.

[20] We use household wealth as a proxy for ownership of household assets.

ing the BH insurgency on IPV outcomes using the DD model specified in Eq. (1) and applying the weights from the PSM.[21]

## 5. Results

### 5.1. Difference-in-difference (DD) estimates

IPV trends in BH affected areas from the matched sample are shown in Table 2. The matched sample contains data on 2,570 women living in the BH affected area and 21,300 women living in areas not affected by BH. In the BH-affected area, the proportion of women experiencing physical or sexual IPV is unchanged at around 10 percent. In the non-BH area however IPV rates fall from 17 to 12 percent between 2008 and 2013.

We present the estimation results for IPV using the matched sample in Table 3. Column (1) reports the results for a model with no covariates. We add controls for individual characteristics in column (2) and for individual and state characteristics in column (3). Across the three specifications the estimated impact of the BH insurgency on the probability of a woman experiencing IPV is an increase of around 4 percentage points. The statistical significance increases to the 5 percent level in the models which include the control variables. Overall, estimates of the effect of the BH insurgency on IPV risk are stable across specifications.

The discussion of results that follows refer to our preferred specification, which includes individual, household, and partner characteristics as well as Nigeria-specific factors and state fixed effects (Column 3 in Table 3). The individual and household characteristics correlated with increased risk of women's experience of physical or sexual IPV are: having more children (0.3 percentage points for each additional child), marriage as a child (2.6 percentage points), having a sometimes or often drunk partner (14.5 percentage points) and marriage in a polygamous household (1.9 percentage points). Condoning IPV and witnessing IPV as a child are also both associated with increased IPV risk; having a father who beat their wife/partner (12.4 percentage points) and condoning wife beating (4.4 percentage points). The finding that the largest increased risk of IPV is correlated with having a mother who was beaten by their husband/partner and having a husband/partner who is sometimes or always drunk is consistent with findings from research about generational cycles of IPV (Knight et al., 2013; Lipsky et al., 2005; Thornberry et al., 2012) and other research that establishes the association of IPV perpetration with drug and alcohol abuse (Devries et al., 2013; Hanmer & Klugman, 2016; Lipsky et al., 2005; Thompson & Kingree, 2006; Tumwesigye et al., 2012).

There is a weak correlation (significance level of 10 percent) between receiving earnings in-kind as opposed to no earnings and lower IPV risk (-4.5 percentage points) and no statistically significant association is found between IPV risk and receiving cash only or cash and in-kind earnings. However, unlike the other correlates these findings are sensitive to model specification. Women's receipt of both cash and in-kind and in-kind earnings alone is associated with reduced IPV risk when Nigeria specific factors are omitted from the model. The correlation remains weak, however.

We find that being a female household head is associated with a lower likelihood of experiencing IPV (-3.8 percentage points). This finding is consistent with the hypothesis that women who have more autonomy (as proxied by headship) are less likely to experience intimate partner violence than women with less autonomy.

Turning to Nigeria specific factors, membership of certain ethnic groups is also associated with lower IPV risk. Our findings are consistent with other research using Nigeria's DHS data; being Hausa and Fulani as opposed to being Yoruba is associated with lowering risk of physical or sexual IPV by −5.3 percentage points.[22]

Our findings can be linked to the conceptual framework as follows. First, the increased IPV risk associated with the BH insurgency can be understood as emerging from the conflict's impact on the formal and informal structures that affect the environment where people live and influence what happens there. Second, we find that individual characteristics at different levels of the social system exacerbate the IPV risk associated with conflict. Personal history stands out as witnessing IPV as a child is associated with one of the largest increases in IPV risk. The finding of a large increase in IPV risk associated with alcohol abuse is another example of how the interaction of factors at the personal level of the social ecosystem combines with conflict to make IPV risk greater for some women. We have only a few variables that capture factors that work at the level of formal and informal structures, but it is interesting that female headship, which can be taken as a proxy for women's autonomy is associated with lower IPV risk and conversely that polygamous marriage is associated with increased risk. Missing from our model are female labor market participation and employment variables which research in other conflict settings suggests are important factors in the social ecosystem related to IPV risk and ones that may change with the onset of conflict.

### 5.2. The BH insurgency, controlling behaviors and changes in women's decision making autonomy

In both the BH affected areas of the country and the non-affected areas the proportion of women experiencing controlling behavior of their husband/partner increases during the period of the BH insurgency. However, the increase is greatest in the BH area where the number of women reporting controlling behavior of their husband/partner increases from 60 to 70 percent during the BH insurgency. In contrast, there is only a small increase in the percentage of women experiencing controlling behaviors (from 60 to 62 percent) in the non-BH areas (Table 4).

The proportion of women with decision-making autonomy changes during the BH insurgency in both the BH-affected areas and the non-BH areas. However, only in the case of autonomy over health care decisions does decision-making autonomy decrease for women in BH affected areas (6 percentage points vs. no significant change in non-affected areas). Although more women report decision-making autonomy over major household purchase in both areas, the increase in the proportion of women who have autonomy over major household purchases is larger in the non-BH areas than the BH areas (6 vs. 2 percentage points).

We analyze the impact of the BH insurgency on women's experience of controlling behavior of their husband/partner and on women's decision-making autonomy by estimating the DD model in Eq. (1) on the common support of the matched sample, using controlling behavior of husband/partner, an index of women's household decision-making autonomy and women's earnings

[21] This is implemented with the "*diff*" command in Stata by (Villa, 2016). One advantage of the kernel-based PSM is that it does not uniquely pair observations and as such minimizes the risk of data imbalance and model dependence (Jann, 2017). However, a key assumption is that only variables that are fixed over time (or pre-treatment variables) should be included in estimating the propensity scores. Caliendo & Kopeinig (2008) argue that previous research and information about the institutional settings should be employed in building the model. Hence, we rely on evidence from (Ceriani & Verme, 2018) who find that age; education; employment status: and, ownership of household assets are associated with the decision to stay or flee from BH affected areas. Larger household size, being male, being older and being unemployed were associated with not migrating during conflict while more years of education was associated with migrating during conflict.

[22] Nwabunike and Tenkorang's (2017) analysis of the 2008 NDHS finds that Hausa women are less likely to experience physical and sexual violence, compared with Yoruba women.

**Table 2**
Rates of Intimate Partner Violence in Nigeria before Boko Haram (2008) and during Boko Haram (2013), percent.

| | BH Area | | | Non-BH Area | | | |
|---|---|---|---|---|---|---|---|
| Variable | Before BH | During BH | Difference(p.p) | Before BH | During BH | Difference(p.p) | N (Total) |
| Past year physical or sexual IPV | 11 | 10 | 1 | 17 | 12 | −5*** | |
| N | 1,126 | 1,444 | | 9,585 | 11,715 | | 23,870 |

Source: Authors own calculation using data from the 2008 and 2013 Nigeria Demographic and Health Surveys (NDHS).
Note: BH Area defined as NDHS clusters exposed to any BH event within 10 km between 2009 and 2013.
*** Difference in means between before BH and during BH is significant at the 1% level.

**Table 3**
Difference-in-differences estimate of the effect of the Boko Haram insurgency on Intimate Partner Violence in Nigeria.

| Variables | Past year physical or sexual IPV | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| DD Estimate | 0.035* | 0.037** | 0.037** |
| | (0.0196) | (0.0149) | (0.0149) |
| **Covariates** | | | |
| **Individual characteristics** | | | |
| Type of earnings (ref. category: no earnings) | | | |
| Cash only | | −0.0251 | −0.0178 |
| | | (0.0177) | (0.0181) |
| Cash and kind | | −0.0400* | −0.0313 |
| | | (0.0216) | (0.0220) |
| Kind only | | −0.0496* | −0.0454* |
| | | (0.0262) | (0.0263) |
| Total number of children born | | 0.00279** | 0.00297** |
| | | (0.00120) | (0.00119) |
| Married as a child (before 18 years of age) | | 0.0219** | 0.0255*** |
| | | (0.00855) | (0.00843) |
| Household head | | −0.0369*** | −0.0380*** |
| | | (0.0107) | (0.0107) |
| **Partner characteristics** | | | |
| Sometimes or often drunk | | 0.152*** | 0.145*** |
| | | (0.0132) | (0.0131) |
| **Household characteristics** | | | |
| Polygamous household | | 0.0186** | 0.0193** |
| | | (0.00851) | (0.00846) |
| **Attitudes and experiences of IPV** | | | |
| Father beat mother | | 0.124*** | 0.124*** |
| | | (0.0174) | (0.0174) |
| Condones wife beating | | 0.0438*** | 0.0441*** |
| | | (0.00919) | (0.00919) |
| **Nigeria specific factors** | | | |
| Ethnicity (ref. category: Yoruba) | | | |
| Igbo | | | 0.00166 |
| | | | (0.0195) |
| Hausa | | | −0.0535*** |
| | | | (0.0207) |
| Fulani | | | −0.0531* |
| | | | (0.0297) |
| Other Ethnicity | | | 0.00563 |
| | | | (0.0165) |
| Religion (ref. category: Christianity) | | | |
| Islam | | | 0.00265 |
| | | | (0.0113) |
| Traditional African religion | | | −0.00296 |
| | | | (0.0329) |
| Other religion | | | −0.0404 |
| State FE | No | Yes | Yes |
| Observations | 24,040 | 24,040 | 23,870 |
| R-squared | 0.003 | 0.105 | 0.107 |

*Note*: Variables used to estimate the kernel propensity scores are dropped. State fixed effects are included. The kernel density function is Epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage. The results are robust to employing a logit estimation of the propensity scores in the first stage, a gaussian kernel density function as opposed to an epanechnikov kernel density function and varying the bandwidth of the kernel density function***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors in parentheses are clustered at the DHS cluster level.

decision-making autonomy as the outcome variables. The results of these analyses are presented in columns (1)-(9) in Table 5.

The impact of the BH insurgency is estimated to increase the probability of a woman experiencing controlling behavior of her husband/partner by 13.8 percentage points, after controlling for individual, partner, and household characteristics, attitudes towards and experiences of IPV, ethnicity, religion, and state fixed effects. However, we find the BH insurgency has no significant effect on women's household decision-making autonomy or women's earnings decision-making autonomy.

These findings are consistent with the evidence regarding the effects of conflict on women's status within the household. In Colombia, for instance, women displaced by the armed conflict often become the main breadwinners for their households, they work more hours than their partners, but also maintain their roles as primary caregivers. However, bargaining power, proxied by a woman's wage contribution to the household's earnings, does not change (Calderón et al., 2011; Wirtz et al., 2014). Data on economic opportunities in Nigeria's conflict-affected states is scarce, however there is some evidence that women's employment has increased and become more important. For example, there are reports of women in civilian militias working alongside security agents and women employed in cash-for work programs and of women's earnings becoming the main source of income for some households.[23] Thus changes in gender-based norms similar to those in Colombia could be occurring in Nigeria.

The discussion of the correlates of controlling behavior that follows refers to our preferred specification, which includes individual, household, and partner characteristics as well as Nigeria-specific factors and state fixed effects (column (3) in Table 5). Having a sometimes or often drunk partner is associated with increased risk of women experiencing controlling behavior of their husbands/partners (11.1 percentage points). Also associated with increased risk of women experiencing controlling behavior of husband/partner are having a father who beat his wife/partner, condoning wife beating, and practicing Islam as opposed to Christianity (8.3, 13.1, and 3.5 percentage points, respectively).

Receiving earnings and having more children are associated with decreased risk of women experiencing controlling behavior (5.2 percentage points for cash only earnings, 11.1 percentage points for earnings in cash and kind and 0.8 percentage points for each additional child). Our findings on the protective effect of earnings in cash and kind are consistent with Hidrobo et al's. (2016) study of Northern Ecuador who find that receipt of food, vouchers and cash transfers were associated with reduced risk of controlling behavior and physical/and/or sexual violence.

To sum up, the presence of BH is associated with large increases in recognized drivers of IPV and controlling behavior of husband/partners. It increases the probability of women experiencing controlling behavior of husband/partner by 13.8 percentage points and the effect is stable across specifications. However, the correlates of these drivers differ. Controlling behavior is mitigated by

[23] Aljazeera, 2019; Unaegbu et al., 2020.

**Table 4**
Women's experience of controlling behavior by husband/partner and women's decision-making autonomy in Nigeria before (2008) and during Boko Haram (2013), percent.

| Variables | BH Area | | | Non-BH Area | | | |
|---|---|---|---|---|---|---|---|
| | Before BH | During BH | Difference (p.p) | Before BH | During BH | Difference (p,p) | N (Total) |
| Controlling behavior by husband/partner | 60 | 70 | 10*** | 60 | 62 | 2*** | |
| N | 1,127 | 1,444 | | 9,600 | 11,715 | | 23,886 |
| Women's household decision- making autonomy | | | | | | | |
| *Autonomy over healthcare* | 50 | 44 | −6*** | 50 | 49 | −1 | |
| *Autonomy over major household purchases* | 39 | 41 | 2** | 44 | 50 | 6*** | |
| *Autonomy over visits to friends and family* | 52 | 49 | −3* | 62 | 58 | −4*** | |
| N | 1,127 | 1,443 | | 9,596 | 11,711 | | 23,877 |
| Women's earnings decision-making autonomy | 89 | 92 | 3*** | 84 | 89 | 5*** | |
| N | 1,039 | 1,383 | | 7,449 | 10,823 | | 20,694 |

*Source*: Authors own calculation using data from the 2008 and 2013 Nigerian Demographic and Health Survey.
Note: *** Difference in means between before BH and during BH is significant at the 1% level. ** Difference in means between before BH and during BH is significant at the 5% level. * Difference in means between before BH and during BH is significant at the 10% level.

women's receipt of earnings of any kind and exacerbated if women condone IPV, have witnessed IPV as a child and by her husband/ partner's use of alcohol.

Our findings can be linked to the conceptual framework as follows. First, the increased risk of experiencing controlling behavior of a husband/partner associated with the BH insurgency can be understood as a result of the conflict's impact at the personal level of the social ecosystem. Second, as in the case of IPV, we find that personal history exacerbates this risk. Increased risk of experiencing controlling behavior is associated with witnessing IPV as a child and, a husband/ partner's alcohol abuse. Interestingly, condoning IPV has a stronger impact on the risk of experiencing controlling behavior of a husband/partner than it does on IPV. In contrast to other forms of IPV risk women's earnings either in cash or cash and in-kind emerge as a fairly strong protective factor for women's risk of experiencing controlling behavior. Of the factors that work at the level of formal and informal structures religion emerges as a correlate of the risk of experiencing controlling behavior with those practicing Islam at higher risk than those practicing other religious faiths.

Our findings are least clear cut with respect to the association between women's receipt of earnings and IPV risk. On the one hand, there is no association between earnings and increased physical and sexual IPV risk linked with the BH conflict in Nigeria although on the other, women's earnings emerge as a protective factor in relation to experiencing controlling behavior from their husband/s partners. The rationale for an association between women's earnings and IPV risk is that more earnings or other resources flowing into the household can reduce sources of tension between men and women which in turn reduce IPV, a suggestion made for example by some of the respondents in a study of Sierra Leone and Liberia (Horne et al, 2014). However, an empirical study of Tanzania finds evidence is mixed on the role women's income and financial contributions has in determining women's IPV risk (Abramsky et al., 2019). Further, research on the impact of cash and other transfers on IPV risk across a number of different countries finds no consistent evidence of IPV risk reduction (Arango et al., 2014; Bobonis et al., 2013). A limitation of our study is that we do not have data on the amount that is earned, number or hours worked or duration of employment which could be used to probe further into our results. We thus interpret our results as consistent with the conclusion of other research in this field that evidence is mixed on the role of economic factors in determining IPV risk but note that this is an area where more research is needed.

In sum, our results are consistent with the premise of the ecological framework that no one factor causes IPV but a complex interplay of factors working at different levels make violence against women more or less likely. Exposure to conflict events impacts the formal and informal structures (the exosystem) which affect the environment in which people live, in the case of the BH insurgency increasing the risk of IPV. Conflictinduced changes in the formal and informal structures do not land on a blank canvas, rather they interact with factors correlated with a higher likelihood of a woman experiencing IPV or controlling behavior, such as having witnessed IPV as a child, her husband's alcohol abuse and her beliefs about the acceptability of IPV. Similarly conflict-induced IPV risk factors interact with individual factors linked to reduced IPV risk, such as women's autonomy or in the case of experiencing controlling behavior of her partner, access to earnings.

### 5.3. Evidence in support of the DD estimation method

A key identifying assumption in the DD model specified in Eq. (1) is that in the absence of the BH insurgency, the differences in the trends of IPV between the BH affected and unaffected area would be the same. To reinforce the plausibility of our DD model, we proceed to a placebo test. While we cannot explicitly test the assumption above, we can present evidence in support of parallel trends. First, in Fig. 5, we present graphs of the mean levels of IPV and its key drivers before and during the BH insurgency. The graphs suggest that in the period before the BH insurgency, the trends in outcomes are parallel between the BH affected area for physical or sexual IPV, controlling behavior of husband/partner and women's household decision-making autonomy as well as women's earnings decision-making autonomy suggesting that the key identifying assumption holds.

For the placebo analysis we use observations from the DV module of the 2008 NDHS- the unaffected cohort and assume women interviewed in the first half of the survey period (June, July, and August 2008) make up the placebo sample before BH insurgency while those interviewed in the second half of the survey period (September, October, and November 2008) make up the placebo sample for the period during the BH insurgency. Since IPV outcomes were less favorable in the BH area, if we find significant coefficients our conclusion is that factors other than BH are responsible for the outcomes and their association with BH is spurious. The results from this estimation are presented in Table 6. We find no spurious significant coefficient. Although the coefficient of women's household decision-making autonomy is significant, this seems unrelated to the BH insurgency as we find no significant relationship between the BH insurgency and women's household decision making autonomy in our analysis. While this result is not proof of parallel trends in outcomes between the BH and non-BH area, it supports the conclusion that the significant effects of the BH insurgency on women's experiences of IPV and its drivers are not spurious.

**Table 5**
Difference-in-differences estimates of the effect of the Boko Haram insurgency on women's experience of controlling behavior and decision-making autonomy in Nigeria.

| Variables | Controlling behavior by husband/partner | | | Women's household decision-making autonomy | | | Women's earnings decision-making autonomy | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| DD Estimate | 0.134*** | 0.138*** | 0.138*** | −0.470 | −0.240 | −0.220 | −0.019 | −0.015 | −0.013 |
| | (0.0412) | (0.0337) | (0.0336) | (0.583) | (0.261) | (0.255) | (0.0217) | (0.0187) | (0.0186) |
| **Covariates** | | | | | | | | | |
| **Individual characteristics** | | | | | | | | | |
| Type of earnings (ref. category: no earnings) | | | | | | | | | |
| Cash only | | −0.0459** | −0.0516** | | −0.0373 | 0.0788 | | | |
| | | (0.0212) | (0.0215) | | (0.230) | (0.217) | | | |
| Cash and kind | | −0.104*** | −0.111*** | | 0.000728 | 0.171 | | | |
| | | (0.0308) | (0.0309) | | (0.404) | (0.402) | | | |
| Kind only | | −0.0588 | −0.0628 | | −0.475 | −0.359 | | | |
| | | (0.0530) | (0.0527) | | (0.636) | (0.629) | | | |
| Total number of children born | | −0.00848*** | −0.00845*** | | 0.0313* | 0.0323* | | 0.00347*** | 0.00334** |
| | | (0.00210) | (0.00209) | | (0.0187) | (0.0183) | | (0.00132) | (0.00133) |
| Married as a child (before 18 years of age) | | 0.00593 | 0.00165 | | −0.357*** | −0.156 | | −0.00100 | 0.00103 |
| | | (0.0122) | (0.0126) | | (0.116) | (0.109) | | (0.00729) | (0.00725) |
| Household head | | 0.00457 | 0.00899 | | 0.882*** | 0.789*** | | 0.0537*** | 0.0525*** |
| | | (0.0193) | (0.0195) | | (0.128) | (0.124) | | (0.0107) | (0.0108) |
| **Partner characteristics** | | | | | | | | | |
| Sometimes or often drunk | | 0.102*** | 0.111*** | | 0.360** | 0.113 | | −0.00840 | −0.00932 |
| | | (0.0175) | (0.0176) | | (0.156) | (0.141) | | (0.0122) | (0.0126) |
| **Household characteristics** | | | | | | | | | |
| Polygamous household | | 0.000844 | −0.00526 | | −0.475*** | −0.289*** | | 0.00645 | 0.00666 |
| | | (0.0131) | (0.0133) | | (0.112) | (0.111) | | (0.00886) | (0.00905) |
| **Attitudes and experiences of IPV** | | | | | | | | | |
| Father beat mother | | 0.0779*** | 0.0834*** | | 0.157 | 0.0752 | | −0.00901 | −0.00949 |
| | | (0.0190) | (0.0190) | | (0.167) | (0.163) | | (0.0127) | (0.0128) |
| Condones wife beating | | 0.133*** | 0.131*** | | −0.421*** | −0.374*** | | −0.00976 | −0.0107 |
| | | (0.0138) | (0.0139) | | (0.128) | (0.128) | | (0.00931) | (0.00925) |
| **Nigeria specific factors** | | | | | | | | | |
| Ethnicity (ref. category: Yoruba) | | | | | | | | | |
| Igbo | | | −0.00704 | | | 0.0191 | | | −0.00184 |
| | | | (0.0300) | | | (0.213) | | | (0.0186) |
| Hausa | | | 0.0161 | | | −1.470*** | | | −0.0324 |
| | | | (0.0381) | | | (0.311) | | | (0.0216) |
| Fulani | | | 0.00599 | | | −1.657*** | | | −0.0935*** |
| | | | (0.0420) | | | (0.361) | | | (0.0319) |
| Other Ethnicity | | | −0.0152 | | | −0.657*** | | | −0.00395 |
| | | | (0.0271) | | | (0.194) | | | (0.0155) |
| Religion (ref. category: Christianity) | | | | | | | | | |
| Islam | | | 0.0349** | | | −0.933*** | | | 0.0144 |
| | | | (0.0169) | | | (0.178) | | | (0.0127) |
| Traditional African religion | | | 0.0218 | | | −1.306** | | | −0.107** |
| | | | (0.0461) | | | (0.556) | | | (0.0504) |
| Other religion | | | 0.0759 | | | −3.566** | | | −0.142 |
| | | | (0.164) | | | (1.671) | | | (0.164) |
| State FE | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Observations | 24,056 | 24,056 | 23,886 | 24,047 | 24,047 | 23,877 | 20,838 | 20,838 | 20,694 |
| R-squared | 0.009 | 0.096 | 0.098 | 0.035 | 0.371 | 0.382 | 0.008 | 0.075 | 0.078 |

Note: Variables used to estimate the kernel propensity scores are dropped. We log-transform the index of women's household decision-making autonomy before estimating the model to allow for the reporting of the estimates in terms of percentages. To take care of zero values, we add 0.0001 to the index before taking the log. Thus, the estimates reported calculated as $(e^{\beta} - 1)$. The estimations use state fixed effects to account for the clustering of IPV among women residing in the same state. The kernel density function is epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage. Kernel-based DD estimates are on the common support. The results are robust to employing a logit estimation of the propensity scores in the first stage, a gaussian kernel density function as opposed to an epanechnikov kernel density function and varying the bandwidth of the kernel density function. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors in parentheses are robust.

*5.3.1. Robustness to varying the BH area buffer zone*

In Fig. 6, we provide evidence demonstrating the robustness of our findings to variation in the radius of the BH area buffer zone. Increasing the radius of the buffer zone progressively includes women residing further away from the location BH events therefore reducing the difference between the number of women in the BH and non-BH area. However, the adverse effect of the BH insurgency on the outcome variables examined in the study is relatively constant in the case of IPV but decreases slowly in the case of controlling behavior as the radius of the buffer zone increases from 5 km to 50 km (Fig. 6.)

*5.4. Limitations of the study*

It is likely that the study underestimates the effect of the BH insurgency as data on IPV and controlling behavior from the areas with the largest number of conflict events are not included in our analysis. Also, the BH insurgency is a regional crisis and we do not

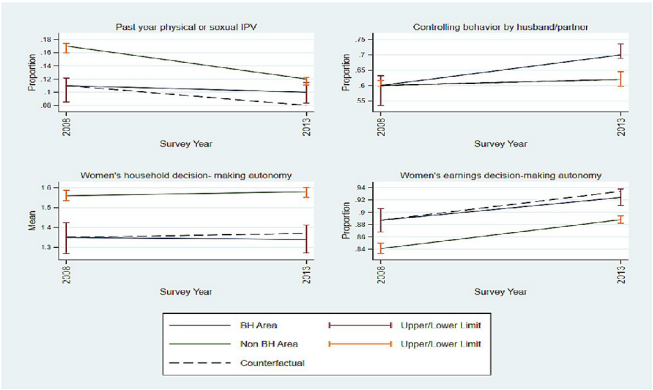



**Fig. 5.** Before and during BH trends.

consider BH activities in the neighboring countries of Cameroun, Chad and Niger which affect Nigerian communities located in areas bordering these countries. Therefore, our estimates represent a lower bound for the effect of the BH insurgency.

Another limitation is caused by the study reliance on GPS coordinates provided in the NDHS as well as the ACLED to identify the BH affected area. The geo-coordinates of the NDHS clusters are randomly displaced to protect the privacy of the respondents (Elkies et al., 2015). Urban clusters are displaced up to 2 km while rural clusters are displaced up to 5 km (Perez-Heydrich et al., 2013). The measurement error introduced may lead to attenuation bias in regressions (Skiles et al., 2013) although robustness analysis does not suggest this is a problem in our estimations.[24]

Furthermore, although the NDHS allows us to examine the effect of conflict on some drivers of IPV, it does not provide enough information to examine important pathways through which the BH insurgency may translate into IPV such as extreme stress and trauma, changing marriage practices and changes in access to economic opportunities for women and other microsystem and exosystem factors suggested by the ecological framework.

Finally, although we deal with changes in population movements to and from the BH affected area (i.e., migration) due to the BH insurgency by using the kernel propensity score matching to match women affected by BH in the period before and during the BH insurgency prior to estimating the difference-in-difference model, we acknowledge that this does not explicitly address the migration issue and biases could remain**.** As discussed in section 4.6 this limitation arises from the data as the 2013 NDHS does not provide information about any previous location and reasons for relocation.

## 6. Conclusion

Our findings add to a growing body of research that establishes a link between exposure to violent political conflict and IPV. We find that the presence of BH increases the probability that women experience physical or sexual IPV by about 4 percentage points after controlling for known correlates of IPV: partner's alcohol use, previous exposure to IPV and condoning IPV as a social norm.

Finding an association between conflict and higher IPV risk is noteworthy as it is not revealed by descriptive statistics on changes in IPV prevalence rates in locations exposed to the BH insurgency. Controlling for differences in individual and household characteristics, descriptive statistics show that IPV rates in the BH-affected areas remained unchanged from the period before the BH insurgency to the period during the BH insurgency. However, IPV declined by 5 percentage points in non-BH affected areas. Therefore, the association of an increased probability of women's experience of physical or sexual IPV by about 4 percentage points with the BH insurgency implies that conflict has stopped progress towards the reduction of IPV that could otherwise have been achieved. We interpret our results as a lower bound of the average causal effect of the BH insurgency on physical or sexual IPV as there are no observations during BH phase for many of the most severely impacted areas.

Previous research has established the association between increased male perpetration of IPV with conflict related trauma, exposure to political violence and behaviors that are associated with increased IPV risk such as increased alcohol abuse (Clark et al., 2010; Gupta et al., 2009; Saile et al., 2013). Our results extend this literature through establishing a link between exposure to conflict and behaviors that are forms of IPV in themselves and known to increase risk of physical and sexual IPV, adding to a thin evidence base. We find that exposure to BH increases the probability of women's experience of controlling behavior of husbands/partners by about 14 percentage points. Access to earnings from employment for women is associated with reduced risk of experiencing controlling behavior of a male partner which suggests that promoting women's economic opportunities in conflict settings might have positive spillover effects on behavioral norms. However, access to earnings has no impact on women's decision-making autonomy and is only weakly associated with reduce physical and sexual IPV risk, so increasing women's access employment opportunities alone is unlikely to be sufficient to change norms and behaviors that are risk factors for IPV. Increasing economic opportunities for women is often perceived as key intervention for addressing IPV, however our results are not conclusive on how effective a course of action this may be. Further research is required to understand the pathways through which conflict exacerbates behaviors that create IPV risk and the factors which can be protective in conflict-affected settings.

IPV is a violation of women's and girl's human rights, a manifestation of gender inequality, and constrains and compromises human development. Investment in multisectoral programs to respond to and prevent IPV is therefore integral to the success of humanitarian and development policies and programs in conflict settings. There is a growing evidence base that demonstrates that violence against women and girls, such as IPV, is preventable within programmatic timeframes. Programs that have been found to be effective seek to end women's economic dependence on men, engage the community through several sectors, and include multiple stakeholders within one community to challenge harmful and unequal gender norms. Effective programs also help couples develop new skills around healthy communication and conflict resolution, and healthy parenting. Sectors like social protection, education and health can be vehicles through which harmful norms and attitudes are challenged and behaviors are changed (Arango et al., 2014; Ellsberg et al., 2015). Programs to address and change harmful gender norms and behaviors at both individual and community levels are needed. Promising interventions include community, school and faith-based initiatives which can be used to affect wider community-level change (Corboz et al., 2019; Glass et al., 2019; Palm et al., 2019). Maintaining an 'all-of-community' approach and ensuring programming is centered on women and girls and designed in a way to ensure accountability to them are critical elements to the success of these types of interventions (What Works to Prevent Violence Against Women and Girls Programme, 2016). Programs to strengthen the health sector, justice, security and shelter system for those who have experienced violence should prioritize facilitating easy and affordable or free

[24] We check if our results are likely to be affected by this bias by restricting the analysis in Tables 4 and 6 to only urban areas where the offset is smaller. We find that our results are robust to this restriction (see appendix section A4).

**Table 6**
Difference-in-differences estimates of the effect of the Boko Haram insurgency on Intimate partner violence, women's experience of controlling behavior by husband/partner and women's decision-making autonomy in Nigeria- Placebo Analysis.

| Variables | Past year physical or sexual IPV (1) | Controlling behavior by husband/partner (2) | Women's household decision-making autonomy (3) | Women's earnings decision-making autonomy (4) |
|---|---|---|---|---|
| DD Estimate (Placebo) | −0.008 | −0.018 | 1.470*** | 0.017 |
| | (0.0213) | (0.0432) | (0.326) | (0.0290) |
| Individual characteristics | Yes | Yes | Yes | Yes |
| Partner characteristics | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes |
| Attitudes and experiences of IPV | Yes | Yes | Yes | Yes |
| Nigeria specific factors - including State FE | Yes | Yes | Yes | Yes |
| Observations | 10,245 | 10,260 | 10,257 | 8,311 |
| R-squared | 0.137 | 0.149 | 0.310 | 0.123 |

*Note*: Variables used to estimate the kernel propensity scores are dropped. We log-transform the index of women's household decision-making autonomy before estimating the model to allow for the reporting of the estimates in terms of percentages. To take care of zero values, we add 0.0001 to the index before taking the log. Thus, the estimates reported calculated as ($e^{\beta-1}$). The estimations include state fixed effects to account for the clustering of IPV among women residing in the same state. The kernel density function is epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage. Kernel-based DD estimates are on the common support. The results are robust to employing a logit estimation of the propensity scores in the first stage, a gaussian kernel density function as opposed to an epanechnikov kernel density function and varying the bandwidth of the kernel density function.***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors in parentheses are clustered at the DHS cluster level.

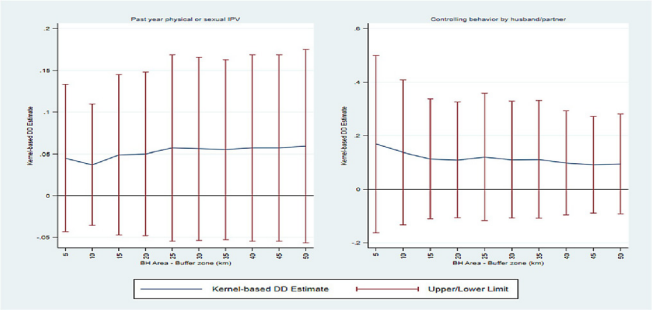



**Fig. 6.** Kernel-based DD estimates for various BH area buffer zones.

access for survivors of IPV. Health services need to respond to post-traumatic psychological and mental health issues and substance abuse, due to their potential to be both a trigger and consequence of IPV.

Violence is learned, and often households' dynamics reinforce the acceptability of the use of violence as a way of exerting power over others and resolving conflict. There are well documented intergenerational effects of IPV, with girls who witness violence more likely to experience IPV in adulthood and boys who witness more likely to perpetrate IPV as adults. The intergenerational effects of violence and the continuum between violence used in private sphere with violence in public spaces calls for robust investment in eliminating IPV, particularly in conflict-affected communities where these dynamics may feed into the perpetuation of conflict. Policy makers should increase investments in IPV prevention and response programming in an effort break the cycles of conflict as well as to protect the human rights of women and girls. In addition, policymakers should continue to prioritize rigorous research on the drivers for increased and sustained IPV in conflict settings, while also exploring the effect of conflict on other forms of violence against women and girls like female genital mutilation and child early and forced marriage.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.worlddev.2021.105780.

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