

Intimate Partner Violence and Household Decision Making Autonomy

Effects of the Malian Conflict on Women

Uche Eseosa Ekhaton-Mobayode

Jocelyn Kelly

Amalia Rubin

Diana J. Arango



WORLD BANK GROUP

Gender Global Theme

October 2021

Abstract

Rates of intimate partner violence vary widely across regions. Evidence suggests that some of this variation can be attributed to exposure to armed conflict. This study exploits variation in the timing and location of conflict events related to the war in Mali to examine the effect of conflict on intimate partner violence and some women's empowerment outcomes. The study used data from the Demographic and Health Survey spatially linked to conflict data from the Armed Conflict Location and Events Database. Wartime conflict increases the prevalence of women's experiences of intimate partner violence. It also increases women's household decision making autonomy

but decreases women's ability to decide how their earnings are deployed. The results imply that to be successful, programs to mitigate these adverse effects of conflict on women need to be context specific and rely on data-driven evidence from situations of conflict whenever possible. Policy makers are called to design programs that address harmful gender norms and intimate partner violence at the individual/household and community levels, especially for women residing in areas with high-intensity conflict. Measurement of women's empowerment should consistently include several domains of women's lives to gauge progress in voice and agency, financial autonomy, and violence reduction.

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Intimate Partner Violence and Household Decision Making Autonomy: Effects of the Malian Conflict on Women

Uche Eseosa Ekhaton-Mobayode^[†], Jocelyn Kelly^[‡], Amalia Rubin,^[†] and Diana J. Arango^[†]

JEL classification: B54; J12; J16; O12

Keywords: Conflict, Forced Displacement, Violence against women and girls, Gender Based Violence, Intimate Partner Violence, Mali

The authors of this paper conducted their research under Gender Dimensions of Forced Displacement project. The project is co-led by Lucia Hanmer and Diana Arango under the guidance of Hana Bixi, Global Director, Gender Unit, The World Bank Group.

Funding: Building the Evidence on Protracted Forced Displacement: A Multi-Stakeholder Partnership". The program is funded by UK aid from the United Kingdom's Foreign, Commonwealth and Development Office (FCDO), it is managed by the World Bank Group (WBG) and was established in partnership with the United Nations High Commissioner for Refugees (UNHCR). The scope of the program is to expand the global knowledge on forced displacement by funding quality research and disseminating results for the use of practitioners and policy makers. This work does not necessarily reflect the views of FCDO, the WBG or UNHCR.

1. Introduction

While IPV may be more common than sexual violence perpetrated by armed actors during war (Stark & Ager, 2011; Global Women's Institute, 2019), it is often far less visible than conflict-related sexual violence (Stark & Ager, 2011; Hynes et al., 2004). For example, a survey of displaced women in northern Uganda found rates of past-year rape by partners was 41 percent compared to 5 percent by non-partners (Stark et al., 2010). Yet, violence faced by women and girls is a continuum, and there is often a link between experiencing multiple forms of violence in conflict settings. For example, in Uganda, Thailand, Côte d'Ivoire and Liberia, women who experience higher levels of conflict-related abuses from non-partners also report higher levels of IPV victimization during and after conflict (Saile et al., 2013; Falb et al., 2013; Gupta et al., 2012; Kelly 2018), and refugee women affected by the Burmese conflict who experienced conflict victimization were 5.9 times more likely to report past-year IPV than women who did not report conflict victimization (Falb et al., 2013). Exposure to conflict related violence in itself has also been linked to increased IPV risk as evidenced by recent analysis of the Liberia Civil War which found that living in a district that experienced fatalities during conflict increases the risk of experiencing multiple types of interpersonal violence in the post-conflict period. After adjusting for known individual-level correlates of IPV, residence in a fatality-affected district was significantly associated with a 50 percent increase in risk of abuse, even 5 years after conflict (Kelly, 2018). In Nigeria, the Boko Haram insurgency increased women's risk of both experiencing of IPV and experiencing controlling behavior from their husbands and partners, after controlling for individual, partner, household and country specific factors, as well as comparing women with similar characteristics using a quasi-experimental analysis design (Ekhatormobayode et al. 2020). These findings suggest that the dynamics within the home that are risk factors for IPV may be exacerbated by armed conflict outside the home.

To better understand the factors that underlie IPV in conflict, scholars have employed the ecological framework adapted by Heise (1998) to understand the interaction between conflict and IPV (Swaine et al. 2019). The adapted ecological framework for conflict and violence against women and girls (Swaine et al. 2019) suggests that exposure to conflict can impact risk factors for experiencing IPV at the individual, interpersonal, institutional, community and societal levels. At the interpersonal level, conflict can impact household stressors, controlling behavior, unequal decision making, division of labor, and men's perception of their lack of ability to fulfill traditional masculine roles, among others (Swaine et al. 2019). These shifts may trigger changes in gendered roles within the household and increase risk factors also associated with increased perpetration of IPV (Ekhatormobayode et al. 2020; Falb et al, 2018). Studies that look at variation in the levels of conflict have indeed found that political conflict can lead to higher levels of IPV (Otsby, 2016; Kelly, 2018).

Evidence from the Democratic Republic of Congo (DRC) suggests that work and income are central to masculine identities - the loss of either can pose significant risks with regards to men's mental health and their desire to exert power within the household (Slegh et al. 2014). In DRC both men and women reported lack of work and income as a trigger for men's use of violence.

[†] World Bank, Washington, D.C, USA.

[‡] Harvard Humanitarian Initiative.

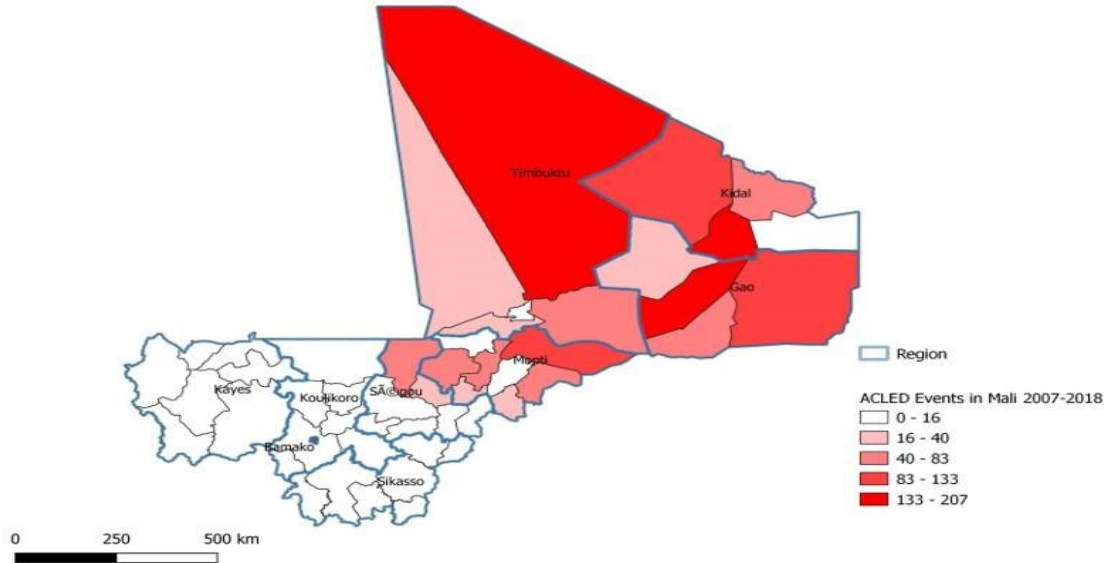
This research contributes to the emerging literature examining the relationship between armed conflict and IPV, analyzing the effect of conflict in Mali on women’s experience of various forms of IPV and their agency within the household. We employ a quasi-experimental method as it is possible that unobserved characteristics affect both conflict and socioeconomic factors, making it difficult to isolate the effect of armed conflict using other approaches. The effect of armed conflict on IPV may be context specific. Therefore, evidence using quasi experimental methods where the data makes it possible to isolate the effect of armed conflict on IPV outcomes is important to strengthen the emerging empirical literature, and can inform evidence-based long and short-term policies to prioritize assistance in conflict affected settings.

Since 2012, Mali has been faced with a complex political, security, and humanitarian crisis which began when groups of armed Tuaregs—a semi-nomadic ethnic minority in northern Mali—joined forces with extremist groups to declare the establishment of the independent state of “Azawad.” As the conflict progressed, jihadist groups took control of the rebellion and, after a successful coup d’état by national soldiers, international armed forces from France, neighboring countries, and the United Nations intervened. Despite an initial peace deal in June 2013 and a ceasefire in 2015, the conflict has continued (Lamarque, 2019). Before this unrest, Mali was recognized as a country with a peaceful democracy. Data gathered for conflict data sets support this reality. The Armed Conflict Location and Events Database (ACLED) shows an average of 16 conflict events reported between 2006 and 2010 compared to 278 events reported in 2011 alone (figure 1). The conflict also led to increased displacement, with over 227,000 newly forcibly displaced people in 2012 (Internal Displacement Monitoring Center, n.d).

High levels of gender inequality pre-date the conflict in Mali. Mali ranked 158 of 162 countries in the most recent Gender Inequality Index (GII), little different from its rank of 143 of 146 countries in 2012 when the conflict began. According to the World Bank Gender Data portal, women’s economic participation has declined since 2000 in all industries except services, and women’s unemployment has increased. In contrast, women’s involvement in politics and decision making has increased since the war began. During the war (2012-2015), the number of seats held by women in parliament decreased. In 2020, political participation of women surpassed pre-war levels (World Bank, n.d).

We use available data from the Demographic and Health Survey (DHS) in a period before and during Mali’s conflict and spatially link the DHS data to conflict data from ACLED. Trends in the ACLED data allow for the clear distinction between periods and locations of high conflict and relatively little or no conflict. This provides an opportunity to exploit the variation in the timing and location of wartime conflict in Mali and isolate the effect of wartime conflict on the study outcomes. This study adds to existing quantitative studies using quasi experimental methods to examine the effect of armed conflict on various human development outcomes (Ekhatormobayode and Asfaw 2019; Chukwuma and Ekhatormobayode 2019). It builds on Ekhatormobayode et al. (2020), which uses a similar method to isolate the effect of the Boko Haram (BH) insurgency in Nigeria on women’s experiences of IPV, which finds increased experiences of IPV in BH affected areas after controlling for individual, partner, household, and country specific characteristics.

Figure 1: ACLED Conflict Events in Mali, 2007 – 2018



Source: Authors own calculation using data from ACLED and Mali shape files from the Database of Global Administrative Areas – GADM.

2. Methodology

2.1 Data and sample construction

The study sample is drawn from the 2006 and 2018 Mali Demographic and Health Surveys (DHS)- both of which are nationally representative household surveys that provides data on population, health, and nutrition for women aged 15-49 in Mali. Both surveys include information on the location of the interview and its GPS coordinates as well as a Domestic Violence (DV) module asking women about their experiences of IPV. The 2006 Mali DHS provides data for the period before protracted conflict in Mali (referred to as “peacetime” hereafter). The 2018 Mali DHS provides data for the period during protracted conflict in Mali (referred to as “wartime” hereafter). Exposure to wartime conflict is measured using conflict events reported by ACLED. ACLED collects real-time data on the locations, dates, actors, fatalities, and types of all reported political violence and protest events across various countries. These events are recorded by date and type whether they generate fatalities or otherwise. We spatially link observations from the 2006 and 2018 Mali DHS to events recorded in the ACLED for Mali using the GPS coordinates provided in both the DHS and ACLED. Although anecdotal reports suggest that the current crisis in Mali began in 2012, we consider all events after the period of peace in our study, i.e., we consider all events between 2007 to 2018. We identify 1,926 events during this period with over 95 percent of these occurring between 2012 and 2018.

2.2 Measuring Exposure to Conflict

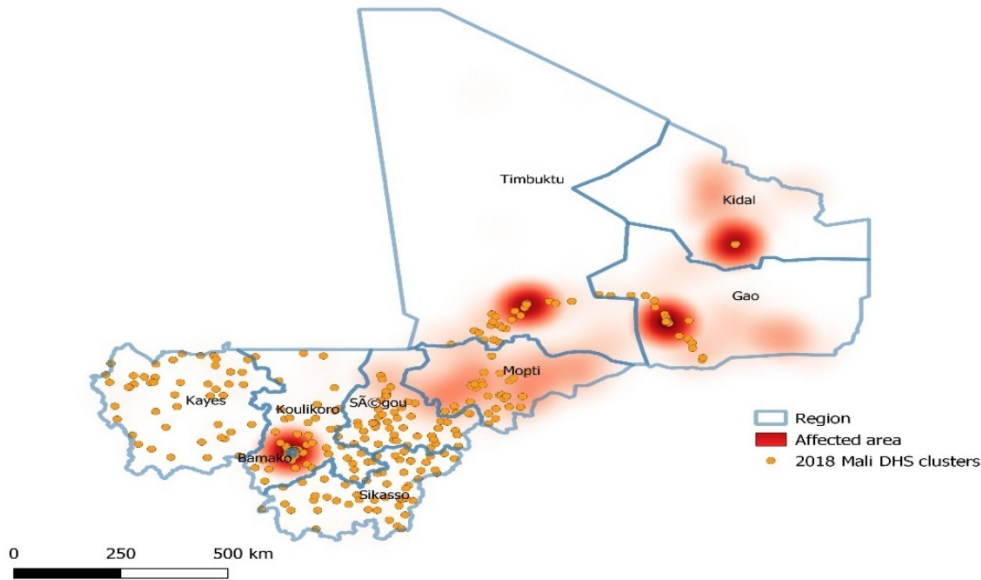
Studies on micro level outcomes exploiting the heterogeneity within country have measured conflict exposure as residence in an administrative area with high intensity of conflict or residence within a target distance of conflict events, i.e., a conflict buffer zone. Ekhatior-Mobayode et al. (2020) measure exposure to conflict as residence within 10km of any conflict event in the period of interest. We refine this definition and posit that events within the conflict radius do not have the

same weights –closer events are likely to have greater impacts than events further away and so should have greater weights. Hence, we geographically discount the events using an exponential decay function as in Bozolli (2011). This strategy applies a lesser weight the further away a conflict event is from an individual/ household. The sum of events within the 10km buffer is thus given as follows²:

$$\text{Sum of geographically discounted conflict events} = \sum_{x=1}^X e^{-\pi(d(A_i,h))} \quad (1)$$

Where $d(A_i, h)$ is defined as the square of the distance (d) in kilometers between the household (h) and each of the ACLED events (A_i) and π is the distance-discount factor. We estimate the exponential function in equation (1) using nonlinear least squares and calculate the predicted values for events within 10km for each woman in the DHS. These predicted values are then summed to determine the sum of geographically discounted events. Exposure to wartime conflict in Mali is then defined as residence within at least 1 geographically discounted ACLED event within 10km during wartime. Applying this definition of exposure, we find that about 36 percent of the women in our study sample were exposed to wartime conflict. These are the women living in the DHS clusters affected by wartime conflict in Mali and make up the treatment group in our study (see figure 2).

Figure 2: Wartime conflict occurring within 10km of communities surveyed by the Mali Demographic and Health Survey



² We check that the results are robustness to changes in the definition of the distance away from conflict events by exploiting other distance definitions- 20km to 50km. This is especially important since the GPS coordinates for randomly selected respondents in the DHS are displaced to protect the confidentiality of respondents.

2.3 Outcome Variables

We examine the impact of political conflict on women's experience of IPV, experience of controlling behavior from their husbands or partners, earnings decision making autonomy and household decision making autonomy. Both the 2006 and 2018 Mali DHS ask women questions about specific behaviors from the husbands/partners to determine their experience of physical, sexual and emotional IPV. To measure experience of physical IPV, women are asked if they experienced pushing, slapping, arm twisting, punching, kicking, choking and attacking with weapons. For sexual IPV, women are asked whether they experienced forceful sexual intercourse or performance of other sexual acts. For emotional IPV, women are asked whether their husbands or partners humiliated them, threatened them with harm or insulted them to make them feel bad. Because the questions are based on recall and our methodology depends on knowing the timing of the experience of IPV, we focus on women's experiences of IPV in the 12 months before the survey as a proxy for current experience of IPV.³ We create variables measuring past year experience of physical IPV, past year experience of sexual IPV, past year experience of emotional IPV, past year experience of physical or sexual IPV and past year experience of physical, sexual or emotional IPV. Each of these are binary variables, equal to 1 if a woman answers yes to experiencing any behaviors about the various forms of IPV from her husband/partner in the past 12 months and 0 otherwise.

To determine whether a woman experiences controlling behavior from her husband/partner, the DHS asks if 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. We use this to create the variable for controlling behavior, which equals 1 if a woman answers yes to any of these questions and 0 otherwise. To determine earnings decision-making autonomy, women who earned cash for work in the 12 months preceding the survey are asked who usually decides how their earnings are spent. The variable capturing women's earnings decision-making autonomy is equal to 1 if a woman makes decisions alone or jointly with her husband/partner and 0 otherwise. Finally, women's household decision-making autonomy is measured by answers given to questions about three types of household decisions: health care, large household purchases and visit to family. A woman has household decision-making autonomy if she makes decisions alone or jointly with her husband/partner. We create a variable for women's household decision-making autonomy by summing the binary variables indicating autonomy in the three types of decisions. The index ranges from 0 to 3, corresponding to the number of household decisions in which a woman has joint or sole autonomy.

2.4 Control Variables

We account for factors other than conflict that may affect the outcome variables discussed in section 2.3. The covariates are classified as follows: individual characteristics, partner characteristics, household characteristics as well as attitudes and experiences of IPV during childhood (see table 1). The empirical model is described in the next section.

³ Previous work has also used experience of IPV in the past year as proxy for current experience of IPV (see Abramsky et al. 2011 and Ekhatior-Mobayode 2020).

Table 1: Variables used in the analysis

A. IPV	
1. Past year physical IPV	Woman experienced physical IPV in the 12 months preceding the NDHS.
2. Past year sexual IPV	Woman experienced sexual IPV in the 12 months preceding the NDHS.
3. Past year emotional IPV	Woman experienced emotional IPV in the 12 months preceding the NDHS.
4. Past year physical or sexual IPV	Woman experienced physical or sexual IPV in the 12 months preceding the NDHS.
5. Past year physical, sexual or emotional IPV	Woman experienced physical, sexual or emotional IPV in the 12 months preceding the NDHS.
B. Controlling behavior	
6. Controlling behavior by husband/partner	Woman's husband/partner exhibits any control issue. **
C. Decision making autonomy	
7. Women's household decision-making autonomy index	Number of household decisions made alone or jointly with husband/partner
8. Women's earnings decision-making autonomy	Woman decides how her earnings are spent alone or jointly with husband/partner.
D. Covariates	
Individual characteristics	Age in years*; Education*; Employment status*; Type of earnings****; Total number of children born; Married as a child
Partner characteristics	Age in years*; Education*; Employment status*; Sometimes or often Drunk
Household characteristics	Polygamous household; Household headship status; Household size*; Location (rural/urban*); Wealth*
Attitudes and experiences of IPV during childhood	Father beat mother; Condone wife beating.
Other variables	Religion and regional dummies capturing differences in socio-economic conditions between regions

Note: * denotes variables used in the matching stage. ** 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. **** employment type i.e., sector of employment is not available for both years of DHS survey hence type of earnings is used as proxy.

3. Model Specification

In the absence of war, changes in the rates of IPV and the other outcome variables should be similar for both the population exposed to war and those not exposed. However, if exposure to wartime conflict events increases IPV, this will not be true. To test this hypothesis, we estimate the following difference-in-difference (DD) model:

$$Y_{ily} = \beta_0 + \beta_1 WarTime_y + \beta_2 AffectedArea_l + \beta_3 WarTime_y * AffectedArea_l + \beta_4 X_{ily} + \varepsilon_{ily} \quad (2)$$

The DD model exploits the variation in timing and location of the wartime conflict events discussed in section 2.2. The unit of observation for equation (2) is a woman. Y_{ily} is any of the outcome variables discussed in section 3.3 for a woman i , interviewed in an area l , and DHS year y . $WarTime_y$ is a binary variable indicating the DHS year the woman was interviewed. It is 1 for observations from the 2018 Mali DHS during the war and 0 otherwise. $AffectedArea_l$ indicates

whether the woman resides in a wartime conflict affected area discussed in section 2.2. The covariates listed in table 1 are represented by X_{ily} . Finally, ε_{ims} is the stochastic error term. The parameter of interest is β_3 , the difference-in-difference estimate. It measures the average treatment effect of residing in the affected area during wartime in Mali on the outcome variables.

3.1 Estimation Bias

Selection bias across time and groups is common with standard DD models and may bias the estimates from equation (2) (Stuart et al. 2014). It is expected that the difference between women in affected and non-affected areas is constant before and during wartime. However, population movements to and from areas affected by war may impact the composition of women in the affected area. We address this potential source of bias by estimating a kernel-based propensity score matching method to ensure that the differences in composition of women in the affected and unaffected areas before and during wartime are constant based on observables. Specifically, the kernel-based propensity score matching (PSM) method matches each of the individual observations in the group of women who reside in the affected area in peacetime, women who reside in the unaffected area in peacetime and women who reside in the unaffected areas in wartime to the observations of women in the affected areas in wartime. The weights from the balanced sample are then used to estimate the effect of war on the outcomes using the common support of the matched sample in the DD model. Caliendo et al. (2005) suggests that previous research should be relied on in building the matching model. Hence, we rely on evidence from Ceriani and Verme (2018) who find that age, education, employment status, and ownership of household assets are associated with the decision to stay or flee from a conflict affected area.⁴ Thus, the variables used for matching are individual characteristics of the women and their partners using the following variables: age, education, household size, type of settlement (urban versus rural), and household wealth status. The results from estimating the model in equation 2 on the matched sample are presented in the next section.

4. Results

4.1 Difference-in-difference (DD) estimates

4.1.1 Women's experience of IPV

In table 2, we compare IPV trends between the affected and unaffected areas in peacetime and wartime in the study sample. The matched sample includes data on 2,059 women living in war affected areas and 3,710 women living in non-affected areas.

When looking at the combined measure of IPV, prevalence rates increased significantly in both affected and non-affected areas. However, the increase from peacetime to conflict in conflict-affected areas was notably higher than non-conflict affected areas (19 versus 7 percent). All forms of IPV separately also increased significantly in the conflict-affected areas from peacetime to wartime (physical, sexual and emotional IPV). The same is not true in non-affected areas, where physical IPV significantly decreased and the combined measure of physical or sexual IPV stayed the same. Only past-year sexual and emotional IPV increased significantly over the time period in non-affected areas.

⁴ 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.

Table 2: Rates of Intimate Partner Violence (IPV) in Mali in peace and wartime, percent

Variable	Affected Area			Non-Affected Area			N (Total)
	Peacetime (A)	Wartime (B)	Difference (C=B-A)	Peacetime (D)	Wartime (E)	Difference (F=E-D)	
Past year physical IPV	13	17	4**	23	18	-5***	9
N	1503	556		2835	875		5769
Past year sexual IPV	3	8	5***	5	10	5***	6
N	1502	556		2835	875		5768
Past year emotional IPV	9	32	23***	13	29	16***	16
N	1503	556		2835	875		5769
Past year physical or sexual IPV	15	21	6***	24	22	-2	21
N	1503	556		2835	875		5769
Past year physical, sexual or emotional IPV	18	37	19***	28	35	7***	28
N	1503	556		2835	875		5769

Source: Authors own calculation using data from the 2006 and 2018 Mali Demographic and Health Survey

Note: Affected Area defined as DHS clusters exposed to any geographically discounted event within 10km between 2007 and 2018.

*** Difference in means is significant at the 1% level.

Using the DD model described in equation 2, we examine whether the differences in IPV trends between the affected and unaffected areas from peacetime to wartime can indeed be explained by exposure to wartime conflict. The results are presented in table 3.

Table 3: Difference-in-differences estimate of the effect of war on women's experience of Intimate Partner Violence (IPV) in Mali

Variables	Past year physical IPV	Past year sexual IPV	Past year emotional IPV	Past year physical or sexual IPV	Past year physical, sexual or emotional IPV
<i>WarTime_y * AffectedArea_i</i>	0.138*** (0.031)	-0.007 (0.026)	0.115*** (0.038)	0.119*** (0.038)	0.178*** (0.052)
Individual characteristics					
Type of earnings (reference category: no earnings)					
<i>Cash only</i>	0.005 (0.024)	-0.031 (0.017)	0.017 (0.018)	0.005 (0.026)	0.007 (0.027)
<i>Cash and kind</i>	0.052** (0.026)	-0.018 (0.016)	0.054** (0.023)	0.048* (0.028)	0.059* (0.029)
<i>Kind only</i>	0.032 (0.039)	-0.015 (0.016)	0.039* (0.022)	0.032 (0.033)	0.040 (0.035)
Total number of children born	<-0.0001 (0.003)	-0.004** (0.002)	-0.004 (0.002)	-0.001 (0.003)	-0.003 (0.004)
Married as a child (before 18 years of age)	0.008 (0.020)	-0.001 (0.015)	0.001 (0.019)	0.001 (0.022)	-0.006 (0.026)
Partner characteristics					
Sometimes or often drunk	0.234*** (0.081)	0.114** (0.056)	0.189*** (0.064)	0.241*** (0.081)	0.178** (0.077)
Household characteristics					
Polygamous household	0.035** (0.015)	0.010 (0.010)	0.023 (0.014)	0.035** (0.016)	0.039* (0.020)
Household head	-0.028 (0.035)	-0.018 (0.011)	-0.039* (0.022)	-0.038 (0.026)	-0.044 (0.029)
Attitudes and experiences of IPV during childhood					
Father beat mother	0.141*** (0.031)	0.092*** (0.034)	0.092*** (0.025)	0.188*** (0.041)	0.183*** (0.041)
Condone wife beating	0.030 (0.019)	0.031*** (0.010)	0.048*** (0.013)	0.046*** (0.021)	0.062*** (0.022)
Others					
Religion (reference category: No religion)					
<i>Christianity</i>	-0.007 (0.054)	0.033 (0.027)	-0.101** (0.043)	-0.022 (0.056)	<0.001 (<0.001)
<i>Islam</i>	0.028 (0.035)	-0.029 (0.020)	-0.043 (0.028)	0.013 (0.036)	0.032 (0.049)
<i>Other religion</i>	<0.001 (<0.001)	<0.001 (<0.001)	<0.001 (<0.001)	<0.001 (<0.001)	0.034 (0.059)
<i>Regional Fixed effects</i>	Yes	Yes	Yes	Yes	Yes
N					
Before War (Non-Affected Area)	2835	2835	2835	2835	2835
Before War (Affected Area)	1503	1502	1503	1503	1503
Wartime (Non-Affected Area)	875	875	875	875	875
Wartime (Affected Area)	556	556	556	556	556
Total	5769	5768	5769	5769	5769
R-squared	0.06	0.05	0.09	0.06	0.07

Note: Variables used to estimate the kernel propensity scores in the matching stage are dropped in the DD estimation. Estimations are done using weights provided in the DHS data. The kernel density function is Epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors clustered at the DHS cluster level in parentheses.

The results of the DD model show that living in a conflict-affected area increases the probability of a woman’s experience of physical IPV alone by 13.8 percent, emotional IPV alone by 11.5 percent, physical or sexual IPV by 11.9 percent and physical, sexual, or emotional IPV by 17.8 percent after controlling for a woman’s partner and household characteristics, her attitude towards the acceptability of wife beating, her witnessing IPV in childhood within the household, religion and regional fixed effects. We find no effect of the war on sexual IPV alone.

Two covariates are consistently associated with increased risk of women’s experience of IPV. The first is having a sometimes or often drunk partner (23.4, 11.4, and 18.9 percent increase for physical IPV alone, sexual IPV alone and emotional IPV alone respectively and 24.1 and 17.8 percent increase for physical or sexual IPV and physical, sexual or emotional IPV, respectively). The second variable is witnessing a father who physically abused his wife/partner (14.1 percent increase for physical IPV alone, 9.2 percent increase for sexual IPV alone and emotional IPV alone respectively and 18.8 and 18.3 percent increase for physical or sexual IPV and physical, sexual, or emotional IPV respectively).

4.1.2 Women’s experience of controlling behavior and decision-making autonomy

In table 4, we compare trends in experience of controlling behavior as well as trends in decision making autonomy for women in the study sample living in areas affected by the Mali civil war to their counterparts in areas not affected.

Table 4: Women’s experience of controlling behavior by husband/partner and women’s decision-making autonomy in Mali before and during Wartime, percent

Variables	Affected Area			Non-Affected Area			N (Total)
	Peacetime (A)	Wartime (B)	Difference (C=B-A)	Peacetime (D)	Wartime (E)	Difference (F=E-D)	
Controlling behavior by husband/partner	76	68	-8***	74	63	-11***	72
N	1503	556		2835	875		5769
Women’s earnings decision-making autonomy	95	82	-13***	92	86	-6***	91
N	1225	461		1914	546		4146
Women’s household decision- making autonomy	0.79	1	0.21***	0.75	0.60	-0.15***	0.76
<i>Autonomy over healthcare</i>	22	29	7***	17	19	2	20
<i>Autonomy over major household purchases</i>	22	31	9***	21	19	2	22
<i>Autonomy over visits to friends and family</i>	35	40	5**	37	22	15***	34
N	1502	556		2832	875		5765

Source: Authors own calculation using data from the 2006 and 2018 Mali Demographic and Health Survey

Note: Affected Area defined as DHS clusters exposed to any geographically discounted event within 10km between 2007 and 2018.

*** Difference in means is significant at the 1% level.

** Difference in means is significant at the 5% level.

* Difference in means is significant at the 10% level.

In both the affected area and non-affected area, the proportion of women reporting experiencing controlling behavior from their husbands/ partners reduced from peacetime to wartime. However, in the non-affected area the reduction was 3 percent more. Also, in both the affected area and non-affected area, the proportion of women reporting having some autonomy over their own earnings reduced from peacetime to wartime. However, the reduction was 7 percent more in the affected area. Finally, while the degree of women’s autonomy over household decisions reduced from

peacetime to wartime by 0.15 units in the non-affected area, it increased by 0.21 units in the affected area. We estimate the DD model in equation 2 to examine if these trends can be explained by the war. The results from this estimation are presented in table 5.

The results of the DD model show that the presence of the war decreases the probability that a woman has some autonomy over her own earnings by 6.9 percent after controlling for a woman's, partner and household characteristics, attitudes towards the acceptability of using violence towards a partner and experiences of witnessing IPV in childhood, religion and regional fixed effects. We also find that the presence of the war increases the degree of women's autonomy over household decisions by 0.79 units. The component of the household decision making index driving this result is autonomy on decisions about large household purchases and autonomy on decisions about visits to family. We find no effect of the war of women's autonomy on decisions about their own health care. We also find no effect of the war of women's experience of controlling behavior from their husbands/partners.

Table 5: Difference-in-differences estimates of the effect of War on women's experience of controlling behavior and decision-making autonomy in Mali

Variables	Controlling behavior	Earnings decision-making autonomy	Women's household decision- making autonomy			
			Household decision making index	Autonomy on decisions about healthcare	Autonomy on decisions about large household purchases	Autonomy on decisions about visit to family
WarTime_y * AffectedArea_i	-0.019 (0.058)	-0.069* (0.038)	0.790*** (0.176)	0.064 (0.047)	0.125*** (0.045)	0.231*** (0.058)
Individual characteristics						
Type of earnings (reference category: no earnings)						
<i>Cash only</i>	0.013 (0.027)	-	0.161* (0.087)	0.071*** (0.022)	0.039* (0.020)	0.035 (0.031)
<i>Cash and kind</i>	-0.064* (0.035)	-	0.384*** (0.121)	0.114*** (0.032)	0.133*** (0.033)	0.092** (0.040)
<i>Kind only</i>	-0.005 (0.035)	-	0.214* (0.113)	0.003 (0.029)	-0.031 (0.031)	0.095** (0.048)
Total number of children born	-0.009*** (0.003)	0.003 (0.002)	0.043*** (0.009)	0.010*** (0.003)	0.011*** (0.003)	0.011*** (0.003)
Married as a child (before 18 years of age)	0.002 (0.021)	0.006 (0.018)	0.036 (0.071)	0.014 (0.020)	0.054*** (0.017)	-0.022 (0.023)
Partner characteristics						
Sometimes or often drunk	0.067 (0.052)	0.028 (0.044)	0.197 (0.230)	0.063 (0.062)	0.052 (0.059)	0.032 (0.079)
Household characteristics						
Polygamous household	-0.007 (0.024)	0.005 (0.013)	0.038 (0.063)	0.016 (0.019)	0.003 (0.017)	0.002 (0.021)
Household head	0.002 (0.035)	0.054*** (0.018)	0.451*** (0.106)	0.144*** (0.036)	0.108*** (0.032)	0.131*** (0.036)
Attitudes and experiences of IPV during childhood						
Father beat mother	0.071*** (0.027)	-0.074*** (0.035)	0.089 (0.084)	-0.041** (0.020)	-0.033* (0.019)	0.033 (0.030)
Condone wife beating	0.139*** (0.030)	-0.023* (0.014)	-0.174** (0.085)	0.006 (0.023)	-0.009 (0.022)	-0.099*** (0.028)
Others						
Religion (reference category: No religion)						
<i>Christianity</i>	<0.001 (<0.001)	<0.001 (<0.001)	<0.0001 (<0.001)	<0.001 (<0.001)	<0.001 (<0.001)	<0.001 (<0.001)
<i>Islam</i>	0.001 (0.035)	-0.007 (0.015)	0.025 (0.143)	0.040 (0.044)	0.004 (0.041)	-0.014 (0.050)
<i>Other religion</i>	0.019 (0.053)	-0.116** (0.060)	-0.237 (0.179)	0.012 (0.054)	-0.025 (0.049)	-0.096 (0.060)
<i>Regional Fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
N						
Before War (Non-Affected Area)	2835	1914	2835	2834	2833	2832
Before War (Affected Area)	1503	1225	1503	1503	1503	1502
Wartime (Non-Affected Area)	875	546	875	875	875	875
Wartime (Affected Area)	556	461	556	556	556	556
Total	5769	4146	5769	5768	5767	5768
R-squared	0.05	0.06	0.05	0.05	0.06	0.05

Note: Variables used to estimate the kernel propensity scores in the matching stage are dropped in the DD estimation. Estimations are done using weights provided in the DHS data. 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 0.1 to the index before taking the log. Thus, the estimates reported calculated as $(e^{\beta} - 1)$. The kernel density function is Epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors clustered at the DHS cluster level in parentheses.

4.2 How does migration affect the results?

It is not possible to know the proportion of women who moved out of the conflict-affected area during wartime as the DHS does not ask women about their previous place of residence. However, the DHS asks about the number of years women have lived in their current place of residence. To check that our results are robust to movements into the affected area during wartime, we restrict our sample to women who have lived in their place of residence for the entire duration of the war, i.e., only women who lived in the same location for at least seven years. For women in the 2018 survey, this translates to residing in the same residence for the entire duration of the period of war, i.e., between 2012 and 2018. We estimate equation 1 on the matched restricted sample. The effect of wartime on women's experience of IPV using the restricted sample is consistent with the analysis of the whole sample. This is not surprising as about 84 percent of the sample have lived in their current place of residence for 7 or more years, over 14 percent have remained in the same place for between 1 and 6 years and less than 2 percent with have lived for 1 year or less in their current place of residence.

The results for this estimation for IPV outcomes are presented in Table 6 while the results for controlling behavior and decision-making autonomy are presented in Table 7. As before, the war increased women's experience of physical IPV alone, emotional IPV alone, physical, or sexual IPV, and physical, sexual, or emotional IPV. It is also consistent with increased household decision making autonomy in the main analysis. As before, we find no effect on controlling behavior. While the direction of the effect of the war on earnings decision-making autonomy is the same as in the main analysis, it loses its statistical significance.

Table 6: Difference-in-differences estimates of the effect of war on women’s experience of intimate partner violence – restricted to sample of women living in place of residence for at least 7 years.

Variables	(1)	(2)	(3)	(4)	(5)
	Past year physical IPV	Past year sexual IPV	Past year emotional IPV	Past year physical or sexual IPV	Past year physical, sexual or emotional IPV
<i>WarTime_y * Affected Area_i</i>	0.130*** (0.032)	-0.014 (0.035)	0.129*** (0.039)	0.097** (0.046)	0.167*** (0.057)
Covariates					
Individual characteristics	Yes	Yes	Yes	Yes	Yes
Partner characteristics	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes
Regional Fixed effects	Yes	Yes	Yes	Yes	Yes
N					
Before Wartime (Non-Affected Area)	2365	2365	2365	2365	2365
Before Wartime (Affected Area)	1264	1264	1264	1264	1264
During Wartime (Non-Affected Area)	750	750	750	750	750
During Wartime (Affected Area)	458	458	458	458	458
Total	4837	4837	4837	4837	4837
R-squared	0.05	0.06	0.09	0.06	0.07

Note: Variables used to estimate the kernel propensity scores in the matching stage are dropped in the DD estimation. Estimations are done using weights provided in the DHS data. The kernel density function is Epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage.

***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors clustered at the DHS cluster level in parentheses.

Table 7: Difference-in-differences estimates of the effect of War on Women’s experience of controlling behavior by husband/partner and women’s decision-making autonomy in Mali- restricted to sample of women living in place of residence for at least 7 years.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Controlling behavior	Earnings decision-making autonomy	Household decision making autonomy			
			Household decision making index	Autonomy on decisions about healthcare	Autonomy on decisions about large household purchases	Autonomy on decisions about visit to family
WarTime_{it} * Affected AreaPlacebo_{it}	-0.016 (0.065)	-0.049 (0.045)	0.840*** (0.174)	0.061 (0.047)	0.127*** (0.046)	0.239*** (0.058)
Covariates						
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Partner characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Regional Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N						
Before Wartime- placebo (Non-Affected Area)	2365	1575	2365	2364	2363	2366
Before Wartime- placebo (Affected Area)	1264	1009	1264	1264	1264	1263
During Wartime placebo (Non-Affected Area)	750	472	750	750	750	750
During Wartime placebo (Affected Area)	458	404	458	458	458	458
Total	4837	3460	4837	4836	4835	4837
R-squared	0.06	0.08	0.07	0.04	0.05	0.05

Note: Variables used to estimate the kernel propensity scores in the matching stage are dropped in the DD estimation. Estimations are done using weights provided in the DHS data. The kernel density function is Epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors clustered at the DHS cluster level in parentheses.

4.3. Evidence in support of the DD estimation method

One key identifying assumption of the DD model specified in equation (1) is that in the absence of war, the differences in the trends of the outcome variables between the affected and unaffected areas would be similar. Although it is not possible to empirically test this assumption, we present evidence in support of this assumption. First, in figures 3 and 4, we present graphs of the mean levels of the outcome variables in peacetime and wartime. The graphs suggest that in peacetime, the trends in outcomes are parallel between the affected area and unaffected area, suggesting that the identifying assumption of parallel trends holds.

Figure 3: Peace vs. wartime trends - IPV

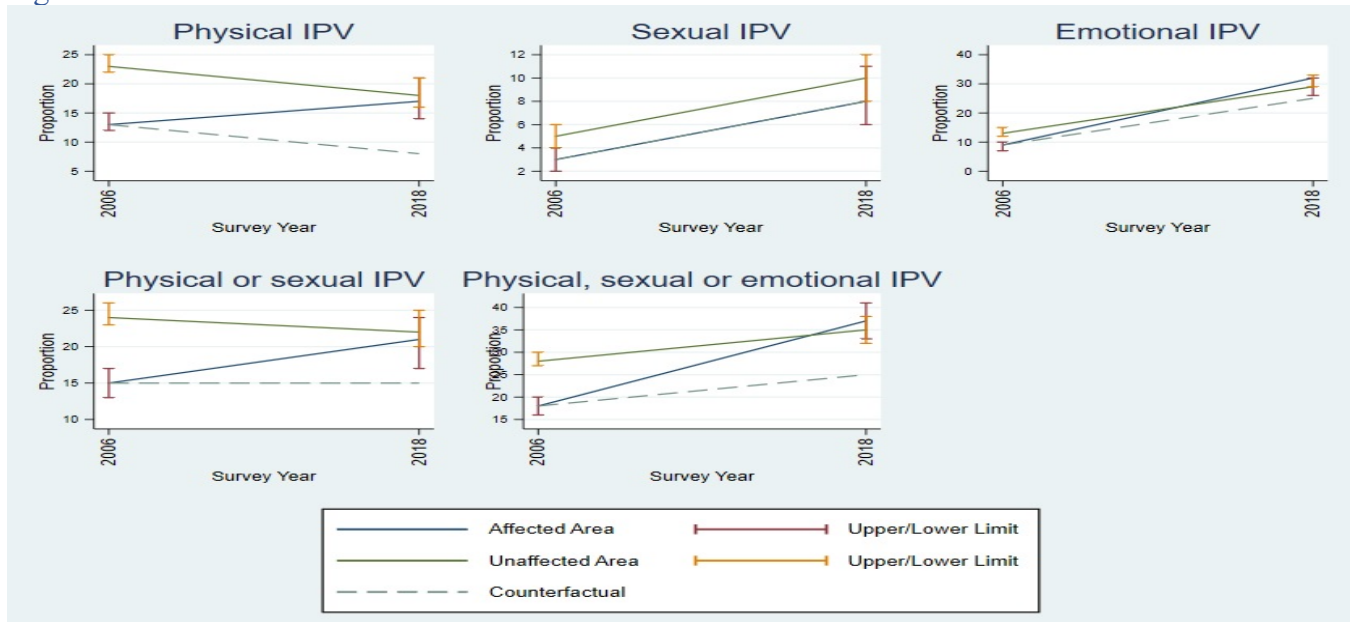


Figure 4: Peace vs. wartime trends – controlling behavior, and decision making



Second, we estimate equation (1) for IPV, decision making and controlling behavior using the sample of women in peacetime only, i.e., using only the 2006 DHS for which eligible women were interviewed between April and December 2006. The results are presented in tables 8 and 9. We assume that women who were interviewed in the first half of the survey period (between April and July) make up the placebo sample in peacetime, while those interviewed in the second half of the survey period (between August and December) make up the placebo sample in wartime. We find no spurious significant coefficient. Although some of coefficients of women's experience of

particular types of IPV are significant, this seems unrelated to the war since the signs are different from the main analysis, again suggesting that the assumption of parallel trends holds.

Table 8: Difference-in-differences estimates of the effect of War on Women’s experience of intimate partner violence – Placebo analysis.

Variables	(1)	(2)	(3)	(4)	(5)
	Past year physical IPV	Past year sexual IPV	Past year emotional IPV	Past year physical or sexual IPV	Past year physical, sexual or emotional IPV
WarTime_y * Affected AreaPlacebo_t	-0.035 (0.035)	-0.036** (0.018)	-0.080*** (0.027)	-0.050 (0.037)	-0.075* (0.040)
Covariates					
Individual characteristics	Yes	Yes	Yes	Yes	Yes
Partner characteristics	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes
Regional Fixed effects	Yes	Yes	Yes	Yes	Yes
N					
Before Wartime- placebo (Non-Affected Area)	1295	1295	1295	1295	1295
Before Wartime- placebo (Affected Area)	692	692	692	692	692
During Wartime placebo (Non-Affected Area)	1538	1538	1538	1538	1538
During Wartime placebo (Affected Area)	802	802	802	802	802
Total	4327	4327	4327	4327	4327
R-squared	0.06	0.04	0.04	0.07	0.07

Note: Variables used to estimate the kernel propensity scores in the matching stage are dropped in the DD estimation. Estimations are done using weights provided in the DHS data. The kernel density function is Epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage.

***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors clustered at the DHS cluster level in parentheses.

Table 9: Difference-in-differences estimates of the effect of War on Women’s experience of controlling behavior by husband/partner and women’s decision-making autonomy in Mali-Placebo Analysis.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Controlling behavior	Earnings decision-making autonomy	Household decision making autonomy			
			Household decision making index	Autonomy on decisions about healthcare	Autonomy on decisions about large household purchases	Autonomy on decisions about visit to family
WarTime_y * Affected AreaPlacebo_t	0.074 (0.047)	0.005 (0.027)	-0.200 (0.158)	-0.034 (0.040)	-0.033 (0.080)	-0.063 (0.250)
Covariates						
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Partner characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Regional Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N						
Before Wartime- placebo (Non-Affected Area)	1295	850	1295	1295	1295	1295
Before Wartime- placebo (Affected Area)	692	580	692	692	692	691
During Wartime placebo (Non-Affected Area)	1538	1034	1538	1537	1536	1538
During Wartime placebo (Affected Area)	802	647	802	802	802	802
Total	4327	3111	4327	4326	4325	4326
R-squared	0.09	0.03	0.05	0.06	0.05	0.05

Note: Variables used to estimate the kernel propensity scores in the matching stage are dropped in the DD estimation. Estimations are done using weights provided in the DHS data. The kernel density function is Epanechnikov with a bandwidth of 0.06. Probit estimation is used for the propensity score in the first stage. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. Standard errors clustered at the DHS cluster level in parentheses.

4.4 Robustness to varying the radius of the affected area

In Figures 5 and 6, we provide evidence demonstrating the robustness of our significant results in sections 4.1.1 and 4.1.2 to variation in the radius of the affected area. Increasing the radius of the affected area increasingly includes women residing further away from the location of conflict events in the affected area and reduces the difference between the number of women in the affected and non-affected areas. We expect a reduction or no change in the magnitude of the adverse effect of conflict events since more women who do not reside in the immediate environment of conflict events are added to the affected area. Figure 5 shows that IPV outcomes are consistent with this expectation – increasingly expanding the affected area to include women residing further away from conflict events reduced the probability that women in the affected area experience IPV. Similarly, figure 6 shows that women closest to the conflict events lose more of their household decision making autonomy compared to their counterparts who reside further away. Finally, the adverse effect of conflict on earnings decision making autonomy remains fairly constant as the radius of the affected area expands, suggesting that conflict has no effect on earnings decision making autonomy for women who do not live in the immediate proximity of conflict events.

Figure 5: Kernel-based DD Estimates for various BH Area buffer zones – IPV outcomes

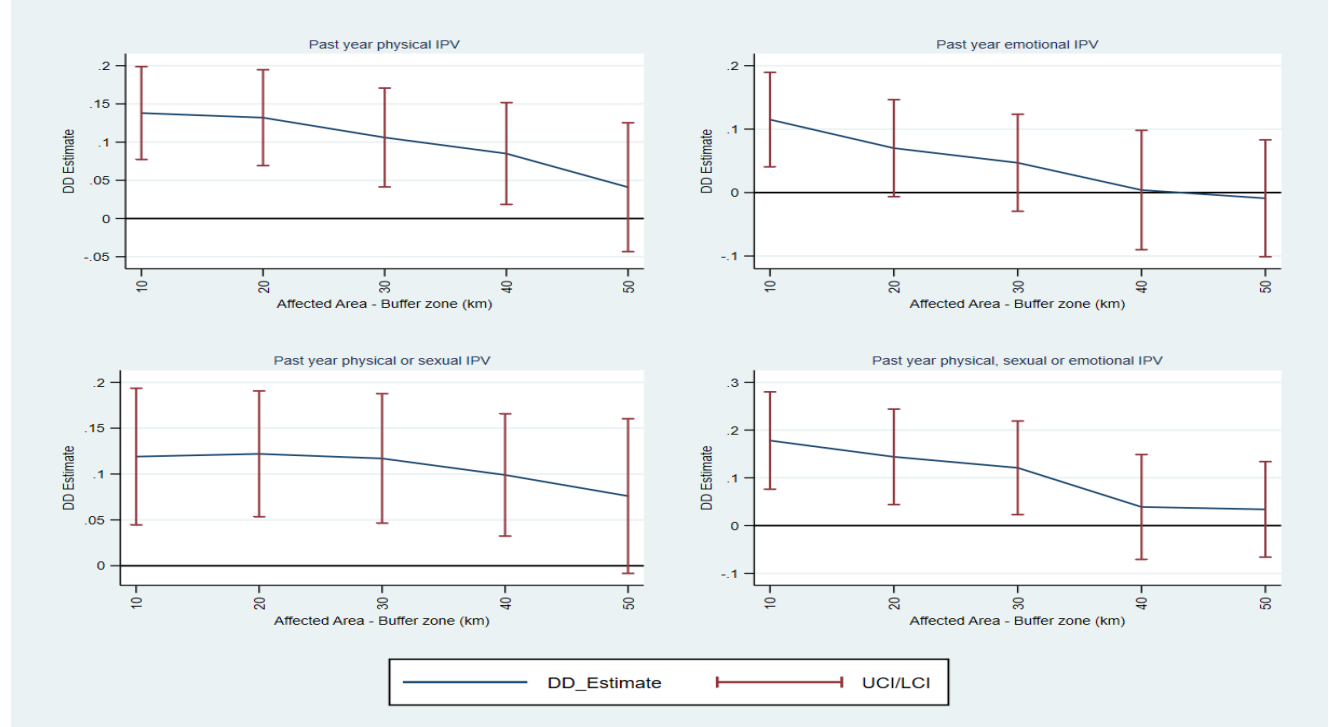
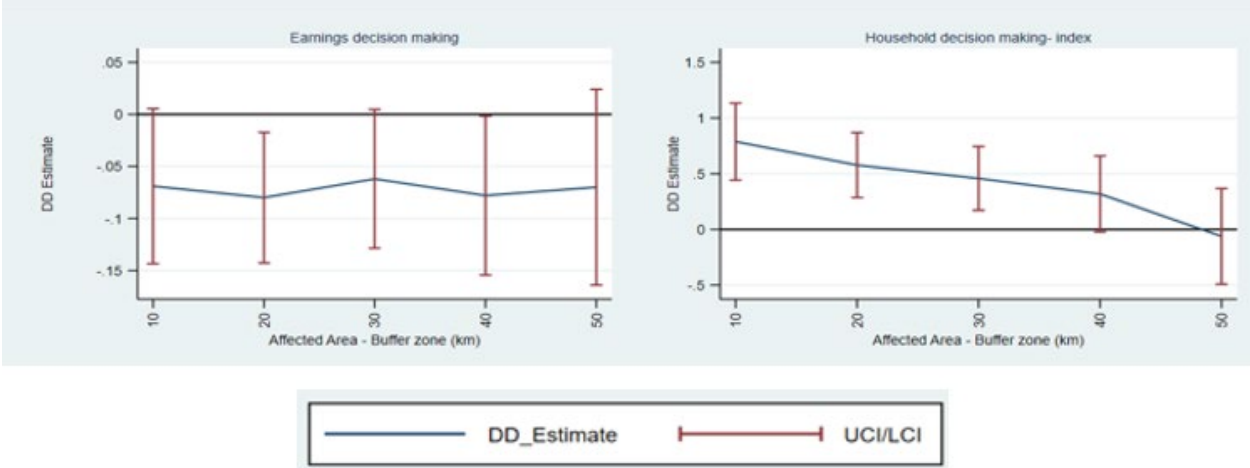


Figure 6: Kernel-based DD Estimates for various BH Area buffer zones – controlling behavior and decision making



5. Discussion and Conclusion

This study exploits variation in timing and location of conflict events during the ongoing civil war in Mali to identify the impact of conflict on women's experience of IPV and decision-making autonomy. Two DHS surveys - one conducted before the conflict and one conducted during the ongoing violence - were spatially linked to conflict data. The difference-in-difference approach allows for matching of women in the two areas to isolate conflict as a driver of increased violence using a rigorous quasi-experimental research design. This approach represents one of the first quantitative, population-based assessments of how the ongoing instability may affect Malian women in key domains of violence and personal decision-making autonomy.

These findings highlight the fact that women living in conflict-affected areas experienced notable and significant increases in all forms of IPV, and combined measures of IPV. In the non-conflict-affected areas, women faced lower levels of physical IPV and no change in the combined measure of physical and sexual IPV. Women in non-conflict affected areas in Mali still experienced increased emotional and sexual IPV. However, when examining the change from peacetime to wartime in the two areas, we see that women living in conflict-affected areas were significantly more likely than their non-affected counterparts to experience multiple forms of IPV, including a combined measure of physical and sexual IPV, as well as physical, sexual and emotional IPV combined. This paper also found an increase in risk of experiencing IPV if a woman has witnessed a father physically abuse his wife/partner or have a partner who is sometimes or often drunk, both known risk factors for IPV.

This study also finds that women in conflict affected areas report greater decision-making within the home in at least some domains – specifically, decision-making related to large household purchases and paying visits to family. This analysis does not permit understanding of the potential pathways for increased autonomy in these areas. However, other scholarship has traced how conflict may lead to higher numbers of women-headed households during instability. Husbands and other male relatives may be injured, missing or killed during conflict and forced displacement. This reality may result in women having greater joint or sole decision-making power in households that are experiencing shifts in traditional power dynamics. It is also possible that the pressing realities of navigating political instability mean that women take more decisions upon themselves or gain greater say in joint decision making. The fact that men may be less present or engaged within the home also highlights the stark findings related to IPV; even while some households may experience changes in composition and certain power dynamics, domestic violence has still increased in conflict-affected areas.

Given this, it is important to consider that improvements in autonomy at the household level alone may not indicate an increase overall gender equality in conflict-affected areas – as starkly highlighted by the results related to IPV. This is particularly salient given the post-conflict context in Mali. The country continues to rank at the bottom of the Gender Equality Index, 158th of 162 countries. Malian women continue to lack legal protections around mobility, employment, pay, GBV and marriage (Trumbic et al, 2020). Mali also continues to show high prevalence rates of IPV and failure to pass a draft GBV law drafted in 2017 that has received strong opposition from the High Islamic Council. Lack of equality in these other areas, coupled with the findings of this paper speak to the need to undertake research that examines women's experiences holistically when examining their safety and empowerment. Further research could support the understanding

of the pathways and dynamics underlying changes in empowerment domains for women and girls and how they are interrelated. This paper highlights the need for continued analyses by investigating different measures of autonomy with IPV. These findings make a strong case for bringing outcomes together to view larger pictures of women's experiences.

The study points to several areas where policy and programming may have the opportunity to reduce violence and increase gender equality within the household. Multi-sectoral programs that address harmful gender norms at the individual, household and community levels are vital to transform gender norms and ensure that women can fully and safely participate in society.

These findings also point to the need to ensure women's substantive participation in peace negotiations and state-building. Preceding the conflict, the Government of Mali launched a National Gender Policy (2010) and National Action Plan for Women, Peace, and Security (2012) – processes that included multi-day consultations with women's civil society organizations while writing the document (Shephard, 2019). However, in the 2015 Bamako Agreement, only 5 percent of peace talk negotiators and 15 percent of the signatories were women (Council on Foreign Relations, 2019). To shift norms and attitudes around gender roles, women's organizations need a significant presence in peacebuilding and state-building efforts. Without this engagement, women will continue to be left behind in peace processes – bearing the brunt of violence that moves from the public to the private sphere.

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