

# Child Marriage Ban and Spousal Abuse: Evidence from Nigeria\*

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## Abstract

Despite the increasing adoption of policies aimed at reducing early child marriage in low- and middle-income countries, particularly in Sub-Saharan Africa, the developmental impact of these policies remains understudied and poorly understood. This study tests whether the Nigeria Children's Rights Act (CRA) of 2003 — which prohibits marriage and infanticide of children under the age of 18 — has led to a reduction in Intimate Partner Violence Against Women (IPVAW). Using a Difference-in-Difference strategy that exploits variation in the intensity of the policy across states and cohorts, I find that the CRA reduced the incidence of IPVAW. In exploring the channels leading to the negative effect of the CRA on IPVAW, the results suggest that the CRA increased women's access to education, employment, asset ownership, and women's agency within their households and reduced their likelihood of having polygamous husbands. The findings shed light on the role of child marriage policies on women's well-being and underscore the importance of empowering women through legal measures for broader societal development and gender equality.

*Keywords:* Marriage, Intimate Partner Violence (IPV), Child Marriage ban, Women empowerment; Gender equality; Gender norms; Nigeria

*JEL codes:* I15, I18, J12, J16

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# 1 Introduction

Worldwide, more than one in 4 women (27%) who are ever-married or cohabitating with a partner have experienced any form of Intimate Partner Violence (IPV).<sup>1</sup> While the scope of this harmful practice is global, its prevalence in Africa is among the highest (Sardinha et al., 2022).<sup>2</sup> Intimate Partner Violence Against Women (IPVAW), recognized as a "major public health issue," is acknowledged for its negative impact on development outcomes, including reproductive health, psychosocial well-being, employment, and income, and for exacerbating gender inequality (Oliver et al., 2019; Stubbs and Szoeki, 2022). This harmful practice are also known to have intergenerational repercussions on children (Madigan et al., 2017). In recent decades, numerous interventions and policies have been designed to tackle IPVAW. Most of these programs aim to empower women (Heath et al., 2020; Sahay et al., 2023; Chatterjee and Poddar, 2020). Concurrently, various initiatives aiming to involve men in the fight against harmful gender norms,<sup>3</sup> such as IPVAW, are also being implemented (Angelucci et al., 2022; Vaillant et al., 2020; Gurbuz Cuneo et al., 2023). However, most of these interventions mainly target women in relationships and have shown mixed results (Buller et al., 2018; Dervisevic et al., 2023; Dunkle et al., 2020; Heath et al., 2020). IPVAW stems from various factors, including women's agency. In a context where gender norms prevail, such as early marriages, which have been demonstrated to undermine women's educational outcomes and career prospects (Field and Ambrus, 2008; Jensen and Thornton, 2003), enduring this harmful practice could weaken their decision-making power within the relationship (Heath, 2014). This dynamic can generate financial stress within the household, making women more vulnerable and exposing them further to violence from their partners.

While programs designed to empower adolescent girls for the rest of their lives could also be seen as a solution to eliminating IPVAW, there is little evidence regarding their effectiveness in reducing this harmful practice. This paper aims to fill this gap by study-

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<sup>1</sup>According to the World Health Organisation (WHO), Intimate Partner Violence Against Women (IPVAW) pertains to actions occurring within an intimate relationship that lead to physical, sexual, or psychological harm or and controlling behaviors (WHO, 2010)

<sup>2</sup>The prevalence of IPVAW in Africa (33%) is higher than in other continents: 25% in the Americas, 27% in Asia, 20% in Europe, and 30% in Oceania.

<sup>3</sup>Gender norms refer to informal societal guidelines dictating the appropriate behaviors and interactions expected from both men and women (Kranton, 2016).

ing the impact of a large-scale policy that bans child marriage by raising the minimum marriage age to 18, which could reduce IPVAW and husbands' controlling behaviors towards women. The paper also explores various short-term and long-term mechanisms that mediate the impact of such a program on IPVAW.

Although the child marriage ban does not directly target IPVAW, this paper focuses on this issue for two main reasons. Firstly, from a developmental perspective, early marriages are known to undermine various development outcomes, including education outcome (Field and Ambrus, 2008), child health (Chari et al., 2017; Perez-Alvarez and Favara, 2023; Sunder, 2019), and women's agency (Efobi et al., 2021; Yount et al., 2018). Women who get married at a young age might display tendencies towards being submissive, inexperienced, socially isolated, susceptible to significant psychological distress, and having diminished influence in bargaining situations. From a theoretical standpoint and based on existing empirical evidence, girls who marry early are less likely to have a higher level of education and better job prospects. This situation could affect their decision-making power within the household, which is known to influence IPVAW (Field and Ambrus, 2008; Jensen and Thornton, 2003). Secondly, in a society where gender norms are prevalent, these gender norms may favor IPVAW. IPVAW perpetrated by men is fueled by gender norms within a patriarchal context (McCarthy et al., 2018). Within this framework, male dominance is encouraged, and behaviors such as aggression, control, and domination are accepted as legitimate means for men to maintain authority and influence over women (Stojetz and Brück, 2023; González and Rodríguez-Planas, 2020; Lawson, 2012). Consequently, a policy that challenges gender norms by banning girls' child marriages could signal to men that girls or women are more comprehensively safeguarded from harmful practices.

Motivated by these two potential arguments, I assess the intent-to-treat impact of the child marriage ban in Nigeria on IPVAW and husbands' controlling behaviors. This policy was enacted by the Nigerian federal government, which raised the minimum age for marriage to 18. I also explore potential short- and long-term mechanisms that could explain the observed effects. I use data from the 2013 Nigeria Demographic and Health Survey (DHS) to investigate this question. I focus on Nigeria for three main reasons. Firstly, Nigeria is among the first African countries to ban child marriage for girls and

infanticide, setting the minimum age for girls' marriage at 18 and prohibiting the infanticide of young girls (Wilson, 2022). To the best of my knowledge, no study has examined how such a policy might impact IPVAW and the husbands' controlling behaviors. Secondly, Nigeria is plagued by a high prevalence of child marriages. According to Girls Not Brides (2022), over 43% of women marry before the age of 18, placing the country among those in Africa with the highest proportions of early child marriages.<sup>4</sup> Given that early marriages are linked to low education levels (Field and Ambrus, 2008; Chen and Zhao, 2022), women's agency (Wodon et al., 2018), which in turn is known to affect IPVAW (Chatterjee and Poddar, 2020; Sara and Priyanka, 2023), the concern arises of understanding whether a policy prohibiting such marriages could reduce IPVAW. Lastly, Nigeria has a high prevalence of IPVAW, with approximately 11% of women having ever experienced IPV.<sup>5</sup> As a result, grasping effective approaches to diminish Intimate Partner Violence (IPV) and enacting targeted policies to combat it can substantially foster developmental growth (Field and Ambrus, 2008; Chari et al., 2017; Efobi et al., 2021; Perez-Alvarez and Favara, 2023; Sunder, 2019; Yount et al., 2018).

To examine the intent-to-treat impact of the Nigeria 2003 child marriage ban on IPVAW and husbands' controlling behavior towards women, I adopt an identification strategy inspired by previous works such as (Wilson, 2022; Duflo, 2001; Larreguy and Marshall, 2017). I use a Difference-in-Difference (DiD) approach that leverages variations in two critical dimensions: (1) the intensity of the child marriage ban, captured by the pre-reform prevalence of child marriages in the women's region of residence, and (2) the women's age when the federal government of Nigeria enacted the policy in 2003. The pre-ban child marriage intensity is measured using the proportion of girls married before age 18 before 2003 in the respondent's region of residence. In this definition, I also consider whether the respondents live in urban or rural areas. Regarding the identification of women exposed to the reform or not, I use the year in which the reform was enacted to determine which women are exposed to the policy. Since the policy increased the minimum marriage age to 18, women exposed to the reform were under 18 years old in 2003, when the federal government enacted the policy. Given that age plays a role in predicting IPVAW, with some evidence suggesting that younger women might be more likely to

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<sup>4</sup><https://www.girlsnotbrides.org/learning-resources/child-marriage-atlas/atlas/nigeria>

<sup>5</sup><https://dhsprogram.com/pubs/pdf/SR264/SR264.pdf>

experience IPVAW than older women (Benebo et al., 2018), I include age-fixed effects in all the specifications. This accounts for the potential age-related variations in women's likelihood of experiencing marital violence. I also control for state-fixed effects that encompass unobservable factors influencing marital violence against women, thereby addressing the confounding influences of region-specific characteristics impacting women residing in the same area. Finally, I include religion and ethnicity fixed effects, taking into account the fixed factors specific to each religion and ethnicity that could influence the occurrence of IPVAW.

Using this specification, I find that the policy prohibiting child marriages, enacted in 2003 by the Federal Government of Nigeria, reduces IPVAW and husbands' controlling behaviors towards women. More specifically, the finding shows that the being exposed to the policy reduced by 13.1 percentage points (pp) the overall prevalence of physical IPVAW. By delving deeper into the analysis of physical IPVAW, categorized into less severe and severe physical IPVAW, I observe that the policy reduced by 13.1 pp and 4.83 pp respectively less severe physical IPVAW and severe physical IPVAW. Moreover, evidence regarding the impact of the policy on emotional and sexual violence shows that the policy reduced emotional IPVAW by 6.45 percentage points but had no effect on sexual IPVAW. In addition, the policy impact on husbands' controlling behaviors toward women led to a decline of 9.43 pp in such behaviours. All these results highlight the effectiveness of the child marriage ban in mitigating harmful practices like domestic violence and husband's controlling behaviors toward women.

The validity of these findings relies on the assumption that changes in outcome variables across birth cohorts in states with a high intensity of child marriage ban, would be similar in the absence of the program compared to the variations observed between birth cohorts in states with a low intensity of child marriage ban. To strengthen this assertion, I employ a placebo test by utilizing cohorts not exposed to the reform, thus providing robust evidence that any spurious factors do not drive the effects of the child marriage ban on the outcome of interest. Subsequently, I also undertake various robustness analyses. These analyses include (i) Using alternative definitions of exposure to the child marriage ban, (ii) utilizing an alternative measure that captures pre-ban child marriage intensity, (iii) excluding regions affected by Boko Haram, (iv) employing continuous measures to

quantify IPVAW and husband's controlling behaviors, and (v) addressing concerns regarding underreporting of IPVAW and husband's controlling behaviors toward women. The impact of the child marriage ban on IPVAW and the husbands' controlling behaviors remains consistent across all of these robustness checks.

Given that gender-based social norms are key drivers of domestic violence ([González and Rodríguez-Planas, 2020](#); [Yilmaz, 2018](#)), and these gender norms are more prevalent in rural areas of Nigeria compared to urban settings ([NPC and IFC, 2019](#)), I explore the heterogeneous effects of the policy based on whether respondents reside in urban or rural environments. While the policy has led to a reduction in all forms of conjugal violence against women, encompassing physical, emotional, and sexual violence, as well as husband's controlling behaviors, in rural settings, I find no evidence of the reform's impact on IPVAW and husband's controlling behaviors in urban areas.

One of the obvious questions is how the child marriage ban that raises the minimum age at marriage could reduce IPVAW and husbands' controlling behaviors toward women. To explore this inquiry, I delve into potential factors that might mediate the observed effects. Specifically, I delve into the short-term and long-term mechanisms that may underlie the negative impacts of banning child marriage on Intimate Partner Violence (IPVAW) and husbands' controlling behaviors in Nigeria. The short-term factors mediating the negative effect of the child marriage ban include the increase in the age at the first marriage and school attainment. The long-term factors mediating the policy's negative impact on domestic violence encompass women's employment and asset ownership solely or jointly with their spouses. In addition, women's decision-making power in the household and their low propensity to marry polygamous men act as mediators for the negative impacts of the policy on instances of domestic violence. These findings align with both theoretical and empirical literature suggesting that improved education and enhanced women's agency within households are factors conducive to diminishing domestic violence ([Bhalotra et al., 2021](#)).

This paper yields three main takeaways. First, developing countries are characterized by child marriages that undermine development outcomes, including human capital accumulation, women's agency, and the prevalence of harmful practices. By showing that

the child marriage ban reduced IPVAW and husband's controlling behaviors, this paper stands as the first, to the best of my knowledge, to showcase that policies prohibiting early marriages have the potential to alleviate harmful practices such as domestic violence against women. This underscores the significance for developing countries to implement policies safeguarding children from child marriages to enhance women's well-being and promote gender equality. Secondly, by revealing that women's education and agency are pathways through which the policy reduces IPVAW and husband's controlling behaviors, this study suggests that initiatives promoting education and women's empowerment, such as education programs or cash transfers to women, are likely to curtail the prevalence of domestic violence against women. Finally, although there is an established literature suggesting that polygamy undermines development by affecting the accumulation of human capital ([Arthi and Fenske, 2018](#)) as well as family well-being ([Tertilt, 2005](#)), this paper provides new evidence that the policy of raising the marriage age to 18 reduces women's propensity to enter polygamous unions. This evidence suggests that such a policy could serve as a lever upon which countries could build their development.

This paper contributes to the literature on factors predicting IPVAW on four main points. First, over the past three decades, governments around the world have implemented policies to prohibit the practice of early marriages. While some research has explored how such policies could impact child marriages ([McGavock, 2021](#); [Wilson, 2022](#)), health related outcome ([Garcia-Hombrados, 2022](#); [Rokicki, 2021](#)), or employment ([Wilson, 2022](#)), evidence regarding the effectiveness of such policies remains limited and are specific to countries ([Bergstrom and Özler, 2022](#)). In a world where more than one in four women is affected by domestic violence and where factors determining this violence include the existence of gender-related norms, this paper is the first, to the best of my knowledge, to explore how such a policy affects IPVAW as well as husbands' controlling behaviors towards women. Secondly, a growing body of literature on the impact of interventions empowering women has demonstrated the beneficial effects of these interventions in reducing domestic violence against women ([Heath et al., 2020](#); [Peterman et al., 2022](#)). I find consistent evidence with this growing literature showing that education, women's agencies and their willingness to be less likely to be in a union with a polygamous man mediate the negative impact of the child marriage ban on domestic violence.

This suggests policymakers should implement policies promoting women's education and agency to promote development. Thirdly, while developing countries are characterized by a high prevalence of polygamy, known to undermine development outcomes (Arthi and Fenske, 2018; Tertilt, 2005), this paper also contributes to the literature related to factors predicting polygamy (Dalton and Leung, 2014; Fenske, 2015). To the best of my knowledge, this paper is the first to demonstrate that a policy prohibiting early marriages would be beneficial in reducing polygamy. Finally, I also contribute to the growing body of literature concerning the factors predicting domestic violence (Anderson, 2021; Heath et al., 2020; Peterman et al., 2022; Stojetz and Brück, 2023) by demonstrating that a policy that challenges gender norms, particularly those related to banning child marriages, can potentially reduce instances of domestic violence.

The remainder of the paper is structured as follows. Section 2 describes the context and The 2003 Child Marriage ban in Nigeria, while Section 3 outlines the data, variables measurement, and summary statistics. Section 4 discusses the identification strategy. While Section 5 presents the results, Section 6 explores potential mechanisms, Section 7 discusses robustness analyses, and Section 8 concludes.

## 2 Context and The 2003 Child Marriage ban in Nigeria

### 2.1 Context

Nigeria — the most populous country in Africa, is located in the continent's western region. It comprises 36 states and a Federal Capital Territory (FCT), Abuja, distributed across six geopolitical zones: North Central, North East, North West, South East, South-South, and South West. Despite its youthful population and abundant natural resources, Nigeria is classified as a "Low Human Development Country" according to the United Nations Development Programme (UNDP) Human Development Index. In 2021, it ranked 163rd out of 191 countries (UNDP, 2022). The persistent poverty in Nigeria remains a fundamental concern despite various government policies, including those related to education and health (Osili and Long, 2008; Ekhatior-Mobayode et al., 2022). Although the



poverty rate has declined by nearly 30 percentage points (27.5 pp) over the past two decades, from 58.4% in 1996 to 30.9% in 2018<sup>6</sup>, limited access to fundamental services such as education and healthcare contributes to the ongoing challenges. For instance, 27.2% of children aged 6 to 11, who are mandated to receive free compulsory education, have never attended school. Similarly, 25.8% of secondary school-aged children (ages 12-17) lack access to education (UNICEF, 2019a).<sup>7</sup> Moreover, an estimated 2,300 children die each year from preventable diseases, resulting in one in eight children failing to reach the age of five (UNICEF, 2019b). Nigeria also faces additional challenges such as conflicts, climate change, and deeply ingrained gender norms, which further exacerbate existing inequalities (UNDP, 2022; Fruttero et al., 2023).

## 2.2 The 2003 Child Marriage ban in Nigeria – The Child Rights Act (CRA)

Nigeria, stands out as one of the countries where child marriage prevails at a high rate. According to Girls Not Brides (2022), almost half of the Nigerian girls (43%) marry before the age 18.<sup>8</sup> Despite declining fertility rates for adolescents aged 15-19, from 166.1 per thousand girls in 1980 to 102.2 per thousand girls in 2020 (see Figure 2 ), early marriage practices remain prevalent in Nigeria. This is in part due to the persistence of social norms, including gender norms, that exacerbate existing inequalities (Fruttero et al., 2023; UNDP, 2022). The absence of formal mechanisms to mitigate idiosyncratic shocks, such as conflicts and climate-related disasters, further increases vulnerability to harmful practices like child marriage, child labor, and intimate partner violence (Corno et al., 2020; Fruttero et al., 2023; Rotondi and Rocca, 2022). The pervasiveness of these harmful practices underscores the need for sustained efforts to promote gender equity and human rights in Nigeria.

In response to widespread violations of children’s rights, the Federal Government of Nigeria took decisive action by enacting the Child Rights Act (CRA) in 2003. This pol-

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<sup>6</sup><https://data.worldbank.org/topic/poverty?locations=NG>

<sup>7</sup><https://www.unicef.org/nigeria/media/2846/file/UNICEF%20Nigeria%20education%20fact%20sheet.pdf>

<sup>8</sup><https://www.girlsnotbrides.org/learning-resources/child-marriage-atlas/atlas/nigeria>

icy was designed with the primary objective of safeguarding and upholding children's rights, specifically those below the age of 18. Despite initial opposition from the Supreme Council for Shari'a in 2002, the CRA eventually prevailed and was passed into law. It comprises 278 sections that explicitly address issues such as child marriage, child labor, and the exploitation of children under 18. Prior to the implementation of the CRA, Nigeria did not have an official age limit for child marriage. However, the CRA introduced provisions that unequivocally prohibit child marriage, child betrothal, and established corresponding penalties for contravening these provisions. Although it is no longer legally possible to marry a child under the age of 18, the law states that the marriage of a child, regardless of the circumstances, is not valid. The law strongly emphasizes that anyone who marries/betrothed or promotes the marriage of a child under 18, commits an offense and will face a fine of ₦500,000 (approximately 645 USD) and/or a 5-year prison sentence.<sup>9</sup>

Although the Federal Government of Nigeria enacted the child marriage ban in 2003, each state legislature is responsible for ensuring its enforcement within their respective jurisdictions. Consequently, the adoption of the Child Rights Act (CRA) has varied across the country, particularly in the northern states, including those governed by Islamic law. Cultural, religious, and ethnic beliefs that perceive such laws as conflicting with traditional values have slowed down or even prevented the adoption of the CRA in these regions (Akinwumi, 2009; Kassam, 1996; Harris, 2012; Nwoke et al., 2022). While the southern states were the first to enact the law, the prevalence of social norms and cultural beliefs in the north posed significant challenges to its adoption. For instance, in certain social groups like the Hausa or Muslims, the onset of puberty or the first menstrual cycle may be regarded as an indication of readiness for marriage or sexual activity.<sup>10</sup> These variations in relation to the year of policy adoption in the states result in a staggered rollout of the program. The staggered adoption of the CRA is presented in Table C2, which shows the year in which each state adopted the policy between 2003 and 2022. The National Human Rights Commission and the National and State Child Rights Implementation Committees conducted awareness campaigns to inform the population about the Child Rights Act (CRA) provisions. These commissions have also been

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<sup>9</sup>Refer to sections 21, 22, and 23 of the Child Rights Act here: <https://www.nigeriarights.gov.ng/files/childrightact.pdf>

<sup>10</sup><https://theconversation.com/why-the-childs-rights-act-still-doesnt-apply-throughout-nigeria-14534>

mandated to listen to people victimized by child-related abuses while prohibiting such abuses per the CRA. They actively collaborate with the relevant authorities to address and sanction these violations.

### 3 Data, variables Measurement and Summary Statistics

In this section, I provide a detailed description of the data used in the analyses, including a thorough definition of how the IPVAV and husbands' controlling behaviors outcome variables were measured.

#### 3.1 Data, variables Measurement

The analyses in this paper primarily rely on data from the Women Module of the Demographic and Health Survey (DHS) conducted in Nigeria from February to June 2013. This timeframe aligns roughly with a decade following the implementation of the child marriage ban by the Federal Government of Nigeria, which prohibits the marriage of children below the age of 18 and child betrothal.<sup>11</sup> The 2013 Nigeria DHS data are representative at both national and regional levels, covering various survey modules including household, woman, and man modules. In this study, I specifically focus on the women's module of the 2013 Nigeria DHS, with a particular emphasis on women selected for the domestic violence module. The study includes ever-married women residing in households who were at least 18 years old at the time of the survey. As this study examines the impact of a policy raising the minimum age of marriage to 18, I restrict the sample to women aged 18 and over. In addition, Since the research primarily focuses on domestic violence, the study only includes ever-married women. Finally, as

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<sup>11</sup>In the main analyses, I utilized data from the 2013 Demographic and Health Survey (DHS) conducted in Nigeria. Although it would have been possible to augment this data with the 2018 DHS data, it was crucial to consider the escalating prevalence of conflict in Nigeria since 2013 (see [Odozi and Oyelere \(2022\)](#)), which has been identified as a significant factor contributing to Intimate Partner Violence (as mentioned by [Ekhatior-Mobayode et al. \(2022\)](#)). Therefore, I use in the main analyses the 2013 Nigeria DHS data. However, in the robustness analysis, I merged the 2013 and 2018 Nigeria DHS to estimate the impact of the Nigeria child marriage ban. Although the results obtained are consistent with those when I used only the 2013 Nigeria Demographic Health Survey, the magnitude of the effects is relatively low. The results of these estimates are available upon request.

in (Garcia-Hombrados, 2022; McGavock, 2021)– in the context of Ethiopia, I restrict the sample analysis to 23 out of the 37 states in Nigeria that enacted the child marriage ban between 2003 and 2013, following its enactment by the Nigerian government before the 2013 survey date.<sup>12</sup>

To capture the primary outcome variables I used in this study, I utilized data from the 2013 Nigeria DHS, which includes a series of questions designed to capture various forms of IPVAW, including physical, emotional, and sexual violence and husband’s controlling behaviors towards women. For each category of IPVAW (physical, emotional, sexual) and husband’s controlling behaviors towards women, a dummy variable is utilized to measure its occurrence. A value of 1 is assigned if the woman has experienced that particular type of violence, while a value of 0 indicates its absence. Specifically, the study focuses on IPVAW within the 12 months prior to the survey. Physical IPVAW is measured by questions about whether women experienced different types of violence, ranging from less severe forms such as being pushed, slapped, punched, having an arm twisted or hair pulled, to more severe forms such as being kicked, strangled, burnt, or threatened with a knife or gun. Sexual violence is measured by questions that ask whether women were physically forced into unwanted sex, other unwanted sexual acts, or forced to perform sexual acts they did not want. Emotional abuse is defined by whether women experienced any of the three forms of violence in the past 12 months before the survey: being humiliated, threatened, or insulted/made to feel bad by their partner. In addition to employing binary outcome variables to assess the prevalence of IPVAW – as suggested in (Boyer et al., 2022) – I use in the robustness analysis a continuous measure of the IPVAW to examine the sensitivity of my results. To address this, I aggregate the binary variables used to measure the different types of IPVAW, including physical, less severe, severe physical, emotional, and sexual IPVAW.

In addition to directly assessing the impact of the policy on IPVAW, this research paper delves into the influence of the policy on husband controlling behaviors towards women, which are known as one of the predictors of IPVAW (Ekhatore-Mobayode et al., 2022). By following (Ekhatore-Mobayode et al., 2022), husband controlling behaviors

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<sup>12</sup>Figure 2 presents a map of the states that enacted the policy, while Table Table C2 in the appendix details the timing of policy enactment for each state from 2003 to 2022.

towards women refer to instances where a woman's partner, within the preceding 12 months, exhibits any of the following actions: (i) expressing jealousy when she interacts with other men, (ii) accusing her of infidelity, (iii) restricting her from socializing with female friends, (iv) limiting her contact with family, or (v) insisting on knowing her whereabouts at all times. Consequently, the variable measuring husband/partner controlling behaviors takes a value of 1 if the woman has experienced any of these behaviors in the 12 months before the survey, and 0 otherwise. As with the IPVAW continuous measures, in the robustness analyses, I employ a continuous measure of husbands' controlling behaviors toward women to additionally evaluate the sensitivity of my results. This alternative measure assigns a value of five if the woman has encountered all five forms of controlling behaviors from her husband or partner, and a value of two if she has experienced two out of the five items of husband controlling behaviors. Table C1 lists the Nigerian DHS survey questions used to measure IPVAW and husband's controlling behaviors.

## 3.2 Summay Statistics

Table 1 displays the summary statistics of the main sample used in this study. This sample comprises ever-married women who were at least 18 years old and were selected to respond to the survey module on domestic violence in the Nigeria 2013 DHS.

Child marriage remains a persistent issue in Nigeria despite the federal government enacting the policy in 2003. Using the main sample, it appears that 54% of women got married before age 18, and 7% were married before age 13. The occurrence of IPVAW in Nigeria varies based on the specific forms of violence women undergo, including physical, emotional, and sexual aspects. 9% of women experienced Physical PVAW, while emotional and sexual PVAW were reported by 12% and 3% of women, respectively. This suggests a higher likelihood of women to experience emotional PVAW than other forms of PVAW. 58% of the respondents experience controlling behaviors from their husband. 35% reported accepting domestic violence, and 30% were in polygamous marriages. Concerning women's empowerment within the household context, their decision-making dynamics fluctuate in response to household needs. For example,

while 4 out of 10 women make decisions about healthcare or household purchases alone or jointly with their husbands or partners, it is only 18% of women who own a house or land alone or jointly with their partners. 67% of women are currently employed, compared to 69% in the twelve months preceding the survey. Although most respondents (57%) identify as Christian, they predominantly reside in rural areas, with only 40% living in urban areas.

## 4 Identification Strategy

### 4.1 Model specification

To examine the impact of the child marriage ban aimed at raising the minimum age for marriage to 18 on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors towards women in Nigeria, I follow (Duflo, 2001; Larreguy and Marshall, 2017; Wilson, 2022) by employing the Difference-in-Difference (DiD) strategy. This methodology capitalizes on variations in (1) the intensity of the child marriage ban, captured by the prevalence of pre-reform child marriages in the women's region of residence, and (2) the age of women when the child marriage ban was enacted by the federal government of Nigeria in 2003. By utilizing this strategy, I assess the primary hypotheses through the subsequent DiD specification:

$$IPVAWHCB_{ics} = \alpha_0 Intensity_s + \alpha_1 UnderAge18atban_c + \alpha_2 (Intensity_s \times UnderAge18atban_c) + \rho_c + \sigma_s + \lambda_i + \psi_i + \eta Urban_i + \epsilon_{ics} \quad (1)$$

Where  $IPVAWHCB_{ics}$  measures the various outcomes variables that measure IPVAW and husband's controlling behaviors toward woman  $i$  in cohort  $c$  and residing in state  $s$ . These outcome variables include physical, emotional, and sexual, partner violence and the husbands' controlling behaviors toward women. The variable  $Intensity_s$  measures the pre-ban child marriage intensity. This variable captures the proportion of women

who married before age 18 in each state of residence and area of residence (urban vs. rural) prior to the reform in 2003.<sup>13</sup>  $UnderAge18atban_c$  indicates whether the respondents were exposed to the child marriage ban or not. This variable takes on the value of 1 if the respondents were under 18 in 2003 and are, therefore, considered to be exposed to the child marriage ban. It takes on the value of 0 if the respondents are old enough to not be exposed to the reform, i.e., if the respondent was at least 28 years old in 2003. In addition to this definition of women who were not exposed to the policy, in the robustness analyses, I consider women who were at least 18 in 2003 as those who were not exposed, as in (Wilson, 2022).<sup>14</sup> The coefficient of interest, denoted by  $\alpha_2$ , measures the impact of the child marriage ban on the outcome of interest. While  $\rho_c$  represents the age-fixed effect that captures women’s likelihood to experience IPVAV or husbands’ controlling behaviors towards women, which might vary according to respondents’ age,  $\sigma_s$  captures state-fixed effects that are specific to each state including gender norms for example that could potentially affect the occurrence of domestic violence. I also control for the religion and ethnicity fixed effects represented by  $\lambda_i$  and  $\psi_i$ , respectively. While  $\lambda_i$  captures religion-specific invariant factors that could affect spousal abuse against women,  $\psi_i$  captures ethnic-specific factors that may predict spousal abuse.  $urban_i$  is a dummy variable that takes one if a woman resides in an urban area and 0 otherwise. As in (Wilson, 2022), to assess the heterogeneous effects of the policy, I estimate equation 1 for each group, encompassing women residing in both urban and rural areas.

All estimates are adjusted using the sampling weights from the DHS survey data, allowing the generalization of the results to the national and regional levels.

## 4.2 Pre-ban Child Marriage Intensity

To measure the pre-ban Child Marriage Intensity in Nigeria, I use equation (2) to compute the proportion of women in state  $s$  who were married before reaching the age of 18 and residing in area  $r$  but who were not subjected to the 2003 child marriage ban. Specifically, my focus is on women who fall outside the scope of the ban—namely, those who were at

<sup>13</sup>Subsection 4.2 provides a comprehensive description of the pre-ban child marriage intensity.

<sup>14</sup>Subsection 4.3 provides a comprehensive description of the criteria distinguishing women who were exposed to the child marriage ban from those who were not.

least 19 years old in 2003. Following (Osili and Long, 2008; Larreguy and Marshall, 2017; Wilson, 2022), this measure of pre-ban child marriage intensity suggests that the policy will have a greater impact in states with high early marriage rates as compared to states with relatively low pre-ban child marriage rates. I estimate equation (2) below using data from the women’s module of the DHS, conducted between March 2003 and September 2003.

$$\frac{(WomenMarriedBeforeAge18)_{rs}}{(TotalNumberOfWomenAged19-49)_{rs}} \quad (2)$$

The variable  $(WomenMarriedBeforeAge18)_{rs}$  represents the total count of women aged 19-49 in state  $s$  and area  $r$  (urban or rural) who were married before the age of 18 in 2003 (the year of the ban). On the other hand,  $(TotalNumberOfWomenAged19-49)_{rs}$  indicates the overall count of women aged 19-49 in state  $s$  and area  $r$ , regardless of whether they married before the age of 18 or not. Here again, I adjusted the measure of pre-reform child marriage ban intensity by utilizing the sampling weights from the DHS survey data.

Unlike (Wilson, 2022), which defines the pre-ban child marriage intensity without taking into account the greater prevalence of child marriages in rural areas compared to urban areas, this definition of pre-ban child marriages takes into account the heterogeneity in the prevalence of the child marriage according to the respondents’ place of residence: urban versus rural. As illustrated in Figure 1 displaying the prevalence of child marriage before the policy across urban (Panel A) and rural settings (Panel B), the occurrence of child marriage exhibits distinct patterns. In urban areas, the prevalence varies between 16.8% and 69.45%, while in rural areas, early marriage rates are notably higher, ranging from 22.03% to 87.78%. It is worth highlighting that regardless of the geographical setting, the northern regions of Nigeria consistently demonstrate a higher incidence of early marriages compared to the southern regions, as observed in both urban and rural contexts.

As in (Osili and Long, 2008), I carry out robustness tests by defining an alternative measure of pre-ban child marriage intensity. In this approach, I assign a value of 1 if the



percentage of women getting married before 18 in state  $s$  is the same as or higher than the median percentage of women married before 18 in the residence area  $r$ . Otherwise, I assign a score of 0. This robustness analysis aims to determine whether the main results will be sensitive to how pre-ban child marriage intensity is measured.

### 4.3 Women exposed to the Nigeria 2003 reform child marriage ban

In Nigeria, the child marriage ban, enacted by the federal government of Nigeria in 2003, prohibits the marriage and infanticide of girls under 18. Therefore, all children who were under the age of 18 in 2003 were exposed to this policy. While the policy was enacted in 2003 at the federal level, the state governments in Nigeria were responsible for enforcing the policy in their respective states. As a result, not all Nigerian states adopted the policy in 2003, and the program's implementation unfolded gradually, with a staggered rollout across the country as shown in Table C2.<sup>15</sup> The identification of women who were exposed or not to the policy raises two essential concerns. Firstly, a priori, the staggered rollout of the policy should allow to leverage of these variations and identify women who were either exposed or not to the policy. However, in this context, where the program was implemented gradually across states, households may have anticipated the policy's implementation even before it was officially enacted at the state level. For instance, Nigerian households residing in states where the policy had not yet been enacted might have either (i) hurried to marry off their children under 18, as was the case in Bangladesh following the 2017 child marriage ban (Amirapu et al., 2020). Alternatively, (ii) they may have become less likely to marry off their children under 18, assuming that the CRA program would eventually be implemented in their respective states of residence.

Given that not all states enacted the policy in 2003, this could lead households to anticipate that the policy will be enacted at some point in their respective states of residence (Amirapu et al., 2020). This anticipation may result in either overestimating or underestimating the policy's effects. In my main or preferred specification, I adopt the year 2003 as

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<sup>15</sup>Drawing from administrative data pertaining to the policy's implementation, it was observed that states took an average of 3.47 years to adopt the policy after its introduction at the federal level in 2003. The span of adoption time varied between 0 and 7 years.

the implementation year for all states, as suggested by ([Abbring and Van den Berg, 2003](#); [Roth and Sant'Anna, 2021](#)). The decision to use 2003 as the year when the policy was enacted for all states is supported by the fact that households in that year (2003) could not anticipate that the policy would be enacted during that year.

Using 2003 as the year when the policy was enacted, individuals exposed to the child marriage ban were under 18 in 2003, when the federal government passed the child marriage ban.

In the robustness analyses, instead of considering 2003 as the year when child marriage and infanticide were banned in Nigeria (when the federal government enacted the policy, see [Table C2](#)), I use the years when each state enacted the policy. This approach supports my preference for using the year 2003 to identify women who were exposed or not to the reform. By doing so, the results remain consistent with the initial or preferred specification. However, the results of this robustness analysis, where I use the year each state enacted the policy, indicate that the magnitude of the impact on age at first marriage is about twice that of my main specification, where I use the year 2003 (see [Table A6](#)). These findings indicate that households residing in states that did not enact the policy in 2003 anticipated its enactment in their respective states, as in Bangladesh (see ([Amirapu et al., 2020](#))). This reinforces my preference for using 2003 in the main analyses to identify women exposed to the reform.

Using 2003 as the year the policy was enacted, individuals exposed to the child marriage ban are those under 18 in 2003, the year the federal government enacted the child marriage ban.

The second challenge lies in the apparent clarity that women exposed to the 2003 child marriage ban in Nigeria are those who were at least 18 years old in 2003. However, considering women who were at least 18 years old in the year when the federal government enacted the policy (2003) could lead to underestimating or overestimating the main effects of the policy on IPVAW in a society like Nigeria, where there is a strong family ties ([Poushter et al., 2019](#)). Indeed, even though women aged at least 18 in 2003 might be categorized as unexposed to the reform, some of these women, whose age tends towards those exposed to the policy, could be subject to exposure in one way or another, given the

policy's potential spillover effect. For example, consider two sisters, A and B, from the same family in Nigeria. Individual A was 16 years old in 2003 and was exposed to the policy, while individual B was 22 years old in 2003 and was not. If individual A is less likely to experience IPV due to the child marriage ban, she might share her experience with her older sister (individual B), who may become less likely to accept IPV or take steps to reduce the potential IPV she experienced after witnessing her younger sister experience less of it. On the other hand, although women's empowerment is often seen as a predictor of domestic violence, individual B may be less likely to encounter it (Chatterjee and Poddar, 2020). This can be attributed to the child marriage ban potentially enhancing the financial autonomy of individual A, leading her to provide financial support to individual B. Consequently, individual B may be less likely to tolerate experiencing partner violence. Such peer effects have been studied in various contexts (Christakis and Fowler, 2007; Fortin and Yazbeck, 2015; Fletcher and Yakusheva, 2016; Chung et al., 2017; Anand and Kahn, 2022).

To avoid underestimating or overestimating the primary effects of the child marriage ban reform on IPVAW and the husband's controlling behaviors, I account for the policy's potential spillover or indirect effects. I adopted a rigorous approach to select women who were not exposed to the reform. Using data from the Nigeria 2003 DHS women module, I identified the average age difference between the first and last child for women with at least two children, which was found to be ten years. Based on this information, I selected women at least 28 years old in 2003 as the control group rather than simply choosing those 18 or older in 2003. However, I tested the robustness of my findings by using an alternative control group comprising women who were at least 18 years old in the policy year instead of my primary control group of women who were at least 28 years old in 2003. The purpose was to assess whether using younger women in the control group would lead to underestimating the main effects of the child marriage ban reform on IPVAW and the husbands' controlling behaviors.

## 5 Results

### 5.1 Main Results

In this section, I discuss the results of estimating the impact of the Nigeria child marriage ban enacted in 2003 on intimate Partner Violence (IPV).

To begin with, I examine the effects of the Child Marriage Ban on child marriage and the age at first marriage. Table 2 illustrates that a one percentage point increase in the intensity of the child marriage ban is associated with a significant decrease in marriages before the ages of 14, 15, and 16 for individuals under 18 at the time of policy implementation, with reductions of 10.8 percentage points (pp), 10.7 pp, and 9.13 pp, respectively. However, there was no discernible impact on marriages before the ages of 17 and 18. Furthermore, the policy effectively raised the average age at marriage by 2.652 years.

Table 3 presents the main findings of this study, estimating the effects of the Nigeria child marriage ban on IPVAW and husband's controlling behaviors. Column 1 of Table 3 indicates that a 1 percent increase in the intensity of the child marriage ban led to a reduction of 13.1 percentage points (pp) in the occurrence of any physical partner violence experience within the 12 months preceding the survey for women under 18 when the policy was enacted. Physical PVAW can be categorized into two forms of domestic violence: less severe physical PVAW and severe physical PVAW.<sup>16</sup> To delve deeper into the analysis, Column 2 of Table 3 focuses on less severe physical IPV, while Column 3 examines severe physical IPV. The results demonstrate that the policy effectively decreases women's experience of less severe physical PVAW by 13.1 pp (Column 2, Table 3) and severe physical PVAW by 4.83 pp (Column 3, Table 3). Regarding other forms of IPVAW, notably emotional and sexual PVAW, while the reform has no effect on sexual PVAW (Column 24, Table 3), I find the policy has reduced emotional PVAW by 6.45 percentage points (pp) (Column 5, Table 3). Estimating the impact of the child marriage ban on husband's controlling behaviors toward women, the result shows that the policy decrease

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<sup>16</sup>Table C1 presents the various questions employed to differentiate between less severe and severe cases of physical PVAW.

by 9.43 pp women likelihood to experience husband's controlling behaviors (Column 6, Table 3).

Overall, women exposed to the child marriage ban experienced less IPVAW and the husband's controlling behaviors toward women, with a more significant reduction in physical PVAW than in other types of violence, such as emotional IPV and sexual IPV or the husband's controlling behaviors. These results suggest that the policy raising the age of first marriage to 18 in Nigeria has decreased the prevalence of harmful practices, mainly physical, emotional PVAW and the husband's controlling behaviors.

The identification strategy is based on the assumption that changes in outcome variables across birth cohorts in states with high intensity of child marriage ban, i.e., states with a high prevalence of early marriage, would be similar in the absence of the program compared to the variations observed between birth cohorts in states with low intensity of child marriage ban. Similar to the approach in (Duflo, 2001), I assessed the validity of this assumption through a control experiment. In this experiment, I re-estimated the equation (1) using women who were not exposed to the child marriage ban. Specifically, I focused on women who were 28 years old or older in 2003 when the federal government of Nigeria enacted the policy. For this placebo test, to identify the control group using the cohort of women who had not been exposed to the reform (aged between 28 and 40 in 2003), I selected women with ages greater than or equal to the median age of this cohort, which ranged from 33 to 40 in the year of the policy (2003). For the treatment group, I selected women aged between 28 and 33. The results of this placebo test, presented in Table 4, provide compelling evidence that the main findings identifying the impact of the Nigeria child marriage ban on IPVAW and husband's controlling behaviors are genuinely attributable to the reform.

## **5.2 Heterogeneity effect: Urban vs. Rural**

Some empirical evidence has indicated a notably higher prevalence of IPVAW in rural areas compared to urban areas in many countries, including Nigeria (NPC and IFC, 2019). Given that prevailing social norms play a pivotal role when it comes to IPVAW (González

and Rodríguez-Planas, 2020; Yilmaz, 2018), and these norms tend to be more entrenched in rural settings than in urban environments, this subsection seeks to discern the distinct impact of the child marriage ban in both urban and rural contexts.

Table 5, which reports the effect of the child marriage ban in urban areas (Column 1, Table 5) and in rural areas (Column 2, Table 5) shows that the policy has no effect on Intimate Partner Violence experienced by urban resident women. However, when we restrict the samples to women residing in rural areas, it appears that the policy reduced all forms of intimate partner violence (physical, emotional and sexual violence) and husband's controlling behaviors by women. This evidence indicates that the negative effect of the child marriage ban that we observe in the main result (see Table 2) is driven by the effect of the program in rural areas, narrowing the gap between rural and urban populations in terms of the prevalence of harmful practices such as IPVAV.

## 6 Potential Mechanisms

In the preceding section, I established the causal impact of the child marriage ban on IPVAV and husbands' controlling behaviors in Nigeria. One of the obvious questions that emerge is how a policy aimed at increasing the minimum age for marriage to 18 could effectively reduce harmful practices like IPVAV and husbands' controlling behaviors toward women. In this section, I explore three potential mechanisms through which the policy could reduce IPVAV and husbands' controlling behaviors toward women. These mechanisms can be categorized into two groups: short-term factors, such as education, and long-term factors, which encompass women's agency and their likelihood of not being in polygamous marriages.

## 6.1 Short-term mechanisms

### 6.1.1 Does child marriage ban increase schooling outcome?

Education stands as a potential mechanism that might underlie the negative impact of the child marriage ban on IPVAW and husband's controlling behaviors. In a scenario where the policy raises the marriage age for women affected by the reform, it becomes conceivable that this change could lead to increased educational outcome. This assumption gains weight from the well-established understanding that marriages tend to undermine educational outcomes (Field and Ambrus, 2008). Education, in this context, offers a twofold avenue to reducing both IPVAW and husbands' controlling behavior against women.

Firstly, education enhances individuals' access to mass media, social networks, and discussions focused on gender inequality matters, factors that are recognized to mitigate Intimate Partner Violence against women (Banyard et al., 2022; Tracy et al., 2023; Vaillant et al., 2020). Secondly, education can act as a mediator for employment opportunities and strengthen women's decision-making influence within the household (Bose and Heymann, 2019; Duflo, 2001)—both acknowledged as predictors of IPVAW.

To empirically test this potential mechanism, I analyze the impact of the child marriage ban on educational outcomes, as illustrated in Table B1. In the first column of Table B1, I present the effect of the child marriage ban on the likelihood of women having attended school at any point. Here, the dependent variable is assigned a value of 1 if the woman has ever attended school and 0 otherwise. Moving to the second column of Table B1, I assess the policy's influence on the probability of women attaining higher education, with the dependent variable taking on a value of 1 for those who have achieved higher education and 0 for those who have not. While the child marriage ban doesn't appear to impact the likelihood of women ever attend school, it does exhibit a significant increase of 5.59 pp in the probability of women exposed to the policy attaining higher education.

## 6.2 Long-term mechanisms

### 6.2.1 Does child marriage ban increase women' empowerment within household for exposed women?

If the child marriage ban reduces both Intimate Partner Violence Against Women (IP-VAW) and husbands' controlling behaviors toward women, a potential avenue for such an effect lies in the realms of employment, women's asset ownership, and their bargaining power within the household. Child marriages are known to undermine educational outcomes. Instead of focusing on their education, which could enhance their prospects in the job market and empower them to build their careers, early-married young girls often find themselves obliged to manage household responsibilities and fulfill duties related to childbearing and childcare. Furthermore, in contexts where women get married earlier due to economic or cultural factors, they may face an increased risk of domestic violence. This vulnerability could stem from their reduced ability to assert themselves within the household due to their youth, lack of maturity, and limited financial independence (Field and Ambrus, 2008; Jensen and Thornton, 2003). Given that employment and women's empowerment have the potential to mitigate intimate partner violence in various settings, I examine whether the child marriage ban has impacted women's jobs and asset ownership (outlined in Table B2), along with their influence over household decision-making (as seen in Table B3).

I assess the effects of the policy child marriages on the likelihood of the following scenarios: (i) engaging in employment within the year preceding the survey (see Column 1 in Table B2), (ii) presently being employed (at the time of the survey) (see Column 2 in Table B2), (iii) holding a paid job (see Column 3 in Table B2). The variable indicating whether a woman was employed in the year before the survey takes on a value of 1 if the respondent worked at least once during the twelve months prior to the survey and 0 otherwise. The variable representing the current employment status (at the time of the survey) is assigned a value of 1 if the respondent reports being currently employed during the time of the survey and 0 otherwise. The variable denoting having a paid job is assigned a value of 1 if the respondent is employed and receives compensation in the form of cash and/or non-monetary benefits and 0 if the respondent worked but did not



receive any remuneration. In terms of asset ownership, the variables reflecting whether (iv) the woman solely or jointly owns the land with her husband (refer to Column 4 in Table B2), or (v) whether the woman solely or jointly owns the house with her husband (refer to Column 5 in Table B2) take on a value of 1 if actual and 0 otherwise.

Although the policy did not lead to a significant increase in women's likelihood to work in the last 12 months before the survey, nor to work currently (at the time of the survey), I found that the child marriage ban increased women's likelihood of being gainfully employed by 7.28 percentage points. However, it is essential to note that the magnitude of the child marriage ban on women's likelihood to work in the 12 months before the survey, or to be currently working (at the time of the survey), is also positive but imprecise. Furthermore, in identifying the impact of policy on asset ownership, I find that policy increases by 16.5 pp and 25.2 pp, respectively, the likelihood of women (i) owning land alone or jointly with their husbands (Column 4, Table B2) or (ii) to own houses alone or jointly with their husbands (Column 5, Table B2).

Next, I identify the impact of the policy on women's bargaining power within the household and find that the policy has increased women's decision-making power within the household. Specifically, the policy increased by 16 pp, 23.4 pp, 7.6 pp, 14.4 pp, and 7.6 pp women's likelihood to (i) decide within the household about health care alone or jointly with husband, (ii) women's propensity to decide about major household purchases alone or jointly with husband, (iii) women's likelihood to decide to visit her family or relative alone or jointly with husband, (iv) women's likelihood to decide what to do with money their husband earns alone or jointly with husband and (v) women's likelihood to use contraception alone or jointly with husband. However, I find no evidence of the impact of policy on women's (respondents') decision to decide alone or jointly with husbands what to do with the money they earn(see Table B3).

These results suggest that women's agency is a potential mechanism leading to the negative impact of the child marriage ban on domestic violence against women.

### 6.3 Does the child marriage ban reduce the likelihood of women entering into polygynous marriages?

In a context where the child marriage ban has been enacted, resulting in a decrease in child marriage due to the raising of the age at the first marriage, one might assume that women exposed to such policy would be more likely to choose their spouse consensually. Consequently, they would exhibit reduced inclination to marry a man who is already in a marital union. The practice of polygyny—where a husband has multiple wives—has been recognized to potentially exacerbate domestic violence in certain contexts ([Ahinkorah, 2021](#); [Hayes and van Baak, 2023](#)). On one hand, this tendency is partly attributed to the financial strain arising when a husband must support multiple wives and potentially numerous children, leading to economic hardships that can contribute to conflicts within the household and elevate the risk of violence between intimate partners ([Arthi and Fenske, 2018](#)). On the other hand, a polygamous man may tend to favor one of his wives within the household, potentially neglecting the others. This favoritism could result in frustration among the overlooked wives, fostering an atmosphere conducive to domestic violence ([Baland and Ziparo, 2018](#)).

In the current context, characterized by policy interventions that have strengthened women's active participation in the labor market, it is conceivable to hypothesize that the financial independence by women could potentially serve as a driving force behind their inclination to enter into polygamous unions. The possession of an autonomous income stream could, in fact, grant women the agency to opt out of engaging in a polygamous marital arrangement.

To test whether the fact that a woman enters into a polygamous union is one of the mechanisms by which the policy reduces IPVAV, I identify in Table [B4](#) the impact of the policy on women's likelihood of being with a man who is in a polygamous union. The variable indicating whether a woman is married to a polygamous man takes the value of 1 when the husband has at least one other wife apart from her and 0 otherwise. To establish this classification, I rely on data from the Demographic Health Survey (DHS), using both the household and women's databases. Specifically, a woman is considered to have a polygamous spouse if she lives with her husband or is the head of the household

and if there are at least two women in the same household, including the respondent, who report that they are wives of the household head or co-wives.<sup>17</sup> As Table B4 shows, the policy reduced women's propensity to be with a polygamous man by 14 pp.

## 7 Robustness analysis

In this section, I conduct several robustness analyses to explore the sensitivity of the main results.

### 7.1 Inclusion of women aged between 18 and 28 in 2003 in the main sample

In the main analyses, I define women who were at least 18 years old in 2003, the year of policy enactment, as those exposed to the child marriage ban. Conversely, women not exposed to the policy are identified as those aged between 28 and 40 in 2003. It's important to recall that I omit women aged between 18 and 27 from the main analysis. This exclusion is intended to mitigate potential indirect effects of the policy that could either understate or overstate the actual effect, as elaborated upon in Section 4.3. In this robustness checking, in addition to considering the main sample (women under 18 and those aged 28 - 40), I also include women aged 18 - 27 to justify the relevance of excluding them (women aged 18 - 27) from my main sample. Table A2 confirms that the inclusion of this subgroup (women aged 18 - 27) to the main sample (women under 18 and those aged 28 - 40), leads to underestimate the impact of the reform on domestic violence when comparing the magnitude of the effects to that observed in Table 3.

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<sup>17</sup>However, I acknowledge that the variable indicating whether the woman has a polygamous husband may be subject to measurement errors, especially if the woman has other co-wives who do not reside in the same household or is unaware that her husband has other wives besides her.

## **7.2 Alternative measure of the pre child marriage ban intensity: Use of a dummy variable measuring the pre child marriage ban intensity instead of using the proportion of women who married before the age of 18.**

In my main specification, I utilize the pre-ban child marriage intensity as the proportion of women who married before 18 in each region before the intervention. To assess the robustness of the outcomes and considering the varying prevalence of early marriages between rural and urban areas, I adopt an alternative metric. This involves the creation of a dichotomous variable: assigned a value of 1 if the proportion of women who married before the age of 18 (before the reform) in a specific region exceeds or equals the median value and 0 otherwise. This dichotomous distinction delineates areas with a high intensity of child marriage ban, contingent on the individual's residential setting—urban or rural. Within this framework, I posit that regions exhibiting a lower pre-existing prevalence of underage marriages prior to the intervention would serve as a suitable counterfactual for regions with a higher intensity of such marriages. Subsequently, I test whether the main findings remain sensitive to this specification. The results derived from this approach, as presented in Table [A2](#), align consistently with those obtained in the main specification.

## **7.3 Excluding regions that are affected by Boko Haram**

While conflicts are known to affect the occurrence of IPVAW and husbands' controlling behaviors ([Ekhator-Mobayode et al., 2022](#); [Torrise, 2023](#)), in a context where Nigeria is affected by conflicts including those engendered by terrorist groups such as Boko Haram, I test whether the main results of this study are not driven by conflict occurrence. To do this, I exclude from the main sample the region of North-East Nigeria known to be affected by Boko Haram. By excluding this region and estimating the impact of the reform on domestic violence against women (see Table [A3](#)), the results remain similar to those of the main results.

## **7.4 Using continuous measures to measure Intimates Partner Violence (IPV) and husband’s controlling behaviors.**

Using a binary framework to gauge domestic violence, which encompasses physical, emotional, sexual, and controlling behaviors exhibited by spouses, offers the advantage of reducing susceptibility to measurement errors compared to the continuous approach applied to these phenomena. However, since continuous measurement captures the frequency and severity of IPVAW and husbands’ controlling behaviors, I estimate the impact of the policy on the continuous measurement of the IPVAW and the husbands’ controlling behaviors to test if the main result are sensitive to how IPVAW are measured (Session 3.1 provides details on the definition of variable outcomes using continuous approaches). The analyses suggest that the effects obtained are consistent with those of the main results (see Table A4). It is noteworthy, however, that the policy displayed no statistically significant effect on emotional violence, despite the observed negative effect.

## **7.5 Using the year in which states enacted the policy to distinguish between exposed and unexposed women, rather than relying on the year when the federal government enacted the policy in 2003.**

While in the main analyses, I utilize the year 2003—when the federal government enacted the child marriage ban to distinguish between women exposed to the policy and those who are not, I refrain from employing the years when individual states implemented the policy. This decision is grounded in the consideration that households situated in states that didn’t enact the policy in 2003 may foresee the policy’s future enactment in their state (as discussed in section 4.3). Instead, I employ the years in which the states implemented the policy to ascertain which respondents are exposed to the policy and which are not.

I use the year of state-level policy enactment and asses the impact of the policy on Intimate Partner Violence (IPV) and the husband’s controlling behaviors toward women. This approach reveals that the policy’s effect on IPVAW and husband’s controlling behav-

iors toward women remains consistent with the main results although the magnitude of the effect is small when compared it to the main result. It's also crucial to note that when employing the year in which the states enacted the policy, the magnitude of the reform's impact on child marriage is nearly twice that of using the year when the federal government enacted the policy. (refer to Table A6). These findings indicate that households in states that did not implement the policy in 2003 anticipated its effects by hastening the marriages of their children before their respective states adopted the policy.

## **7.6 Concerns related to Under-reporting Intimates Partner Violence and husband's controlling behaviors**

Given the sensitive nature of Intimate Partner Violence (IPV) and the potential impact of social desirability bias, there is a concern that the assessment of the child marriage ban's impact might be subject to bias. This could occur if women exposed to the policy are more prone to underreport the IPV they endure than those who are not exposed, or vice versa. Additionally, adopting an alternative perspective, biases could also emerge if women residing in regions with a high prevalence of early marriage are more likely to underreport the IPV their experiences in contrast to those in areas with a lower prevalence of IPV, or vice versa. To control the influence of these potential biases, I include the age and state fixed effects in the main specification. Furthermore, to ascertain that potential underreporting of IPV or husband's controlling behaviors do not pose a threat to the identification strategy, I hypothesize that women undergoing interviews and experiencing interruptions due to the presence of specific individuals in the household—such as adult females, husbands, or adult males—may be more inclined to underreport the IPV or husbands' controlling behaviors they experience from their spouses.

Hence, I add a control variable to equation (1) equation in this thorough robustness analysis. This variable takes a value of 1 if the interview experienced interruptions due to the presence of specific individuals in the household, including adult females, husbands, or adult males; otherwise, it takes on a value of 0. The outcomes of these estimations, as outlined in Table A5, maintain consistent magnitudes and retain their significance levels comparable to the primary findings. This result strengthens my confidence that

the identified impact of the child marriage ban is not influenced by potential factors such as underreporting IPV or the husbands' controlling behaviors.

## **7.7 Sample restricted to women who are currently married at the time of the survey.**

As specified in Section 3, this research targets women who are ever married and includes (i) women who are currently married at the time of the survey, (ii) widows, and (iii) women who are divorced from their partners. The relevance of including widows and divorced women in the main sample is justified by the fact that the NDHS does not provide information on when widowed or divorced women lost their spouses or got divorced. If widowed or divorced women at the time of the survey have experienced more (less) domestic violence from their partners in the 12 months preceding the survey compared to married women, excluding them from the main sample would lead to a selection problem. However, in robustness analyses, I restrict the sample to married women at the time of the survey and estimate Equation 1. As shown in Table A7, the observed results are consistent with the main results.

## **8 Conclusion**

While child marriage is known to undermine the accumulation of human capital, several countries around the globe have implemented policies to prohibit such marriages over the last three decades. Despite the scarcity of rigorous evidence on the impact of these reforms, existing literature on the subject has yielded mixed results concerning the effects of these policies on early marriage, health, education, and employment outcomes. This paper provides novel evidence of how such policies can influence Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors towards women. To achieve this, the study focuses on Nigeria, where the federal government introduced a policy in 2003 prohibiting the marriage and infanticide of children under 18 years of age. Utilizing a Difference-in-Difference strategy that leverages variations in policy intensity

across states and cohorts, I ascertain that the policy has led to a reduction in IPVAW, particularly physical partner violence against women (PVAW), whether it is classified as less severe or severe. Moreover, emotional PVAW and husbands' controlling behaviors towards women have also diminished due to the policy. These results remain robust across various sensitivity analyses, including placebo tests, specifications accounting for occurrences like Boko Haram conflicts, and potential biases stemming from underreporting of IPVAW and husbands' controlling behaviors toward women.

While exploring the potential factors mediating the negative impact of the Nigeria child marriage ban on IPVAW and husbands' controlling behaviors, it appears that education, employment, and women's agency and their willingness to be less likely to be in a union with a polygamous man are the factors mediating the observed effects. The findings highlight two main takeaways. Firstly, in developing countries, child marriages often hinder development outcomes, including human capital accumulation, women's agency, and the prevalence of harmful practices. By demonstrating that the child marriage ban reduces IPVAW and husbands' controlling behaviors, this study stands as the first, to the best of my knowledge, to showcase that policies prohibiting early marriages have the potential to alleviate harmful practices such as domestic violence against women. This underscores the importance for developing nations to implement policies that protect children from child marriages to enhance women's well-being and promote development. Secondly, by revealing that women's education and agency and their willingness to be less likely to be in a union with a polygamous man are the factors mediating the observed effects are pathways through which the policy reduces IPVAW and husbands' controlling behaviors, this research suggests that initiatives promoting education and women's empowerment, such as education programs or cash transfers to women, are likely to decrease the prevalence of domestic violence against women. Finally, while existing research has indicated that polygamy has negative implications for human capital accumulation and family well-being, this study contributes fresh insights by demonstrating that raising the minimum marriage age to 18 decreases the likelihood of women entering into polygamous marriages. The finding suggests that implementing such a policy may offer countries a potential mechanism to bolster their development efforts



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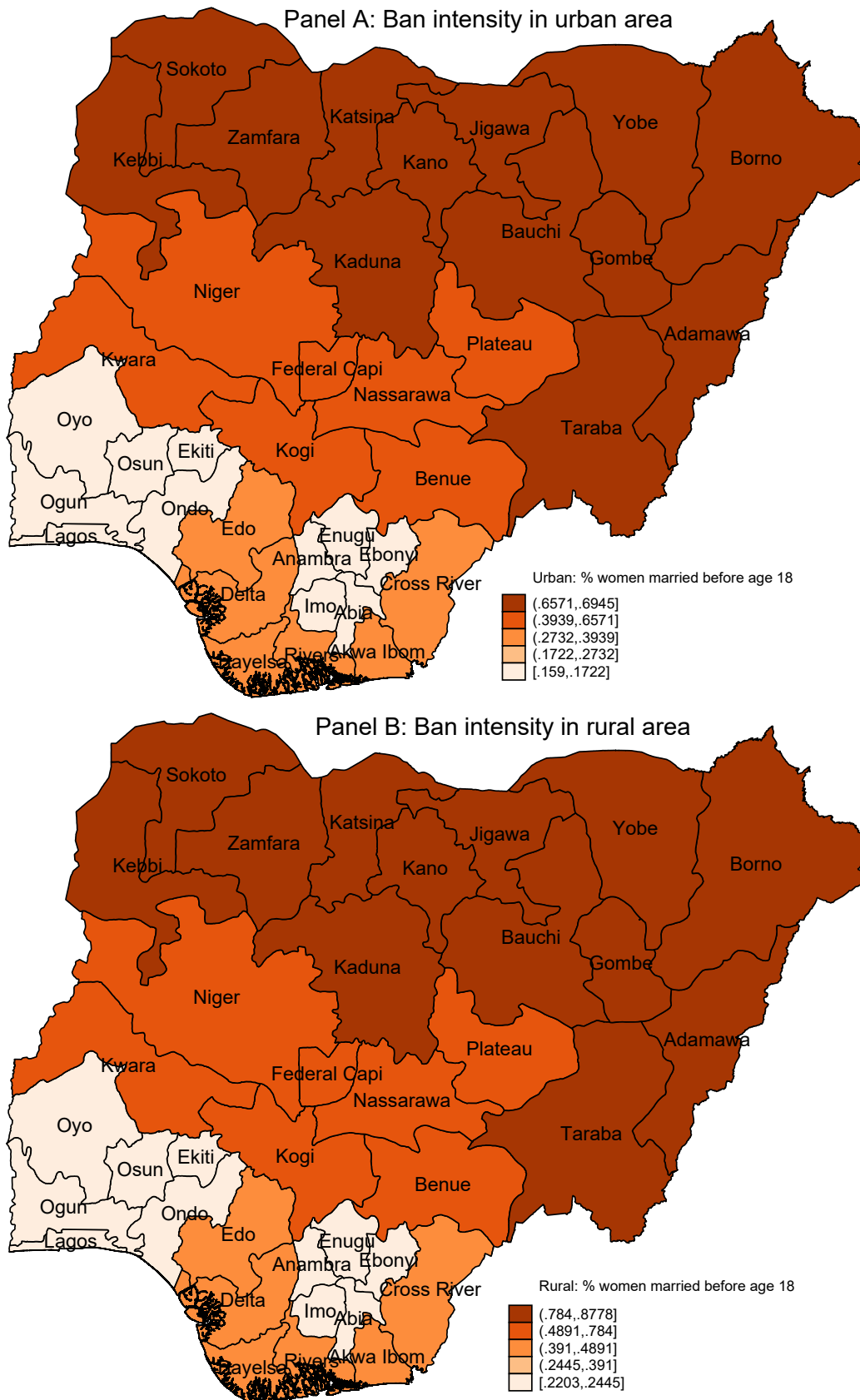
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**Figure 1: Pre ban Child Marriage Intensity in urban and rural areas in 2003**



Source: Author's estimations based on Nigeria 2003 DHS.

Notes: This figure provides a glimpse into the prevalence of early marriage among women between the ages of 19 and 49 in urban areas (Panel A) and rural areas (Panel B). The data source is the 2003 Nigerian DHS.



**Table 1: Summary statistics**

	Mean (1)	SD (2)	N (3)
<b>Marriage outcome</b>			
Child Marriage before age 13	0.07	0.25	8043
Child Marriage before age 14	0.14	0.35	8043
Child Marriage before age 15	0.25	0.43	8043
Child Marriage before age 16	0.37	0.48	8043
Child Marriage before age 17	0.46	0.50	8043
Child Marriage before age 18	0.54	0.50	8043
Age at Marriage	18.02	4.92	8043
<b>Intimate Partner Violence (IPV) and experience husband' controlling behaviours</b>			
Any physical IPV	0.09	0.28	8022
Less severe physical IPV	0.08	0.27	8024
Severe physical IPV	0.03	0.18	8026
Emotional IPV	0.12	0.32	8026
Sexual IPV	0.03	0.17	8020
Controlling behaviors	0.58	0.49	7965
<b>Women acceptance of domestic violence</b>			
Acceptance of domestic violence	0.35	0.48	7909
<b>School outcomes</b>			
Ever attended school	0.54	0.50	8043
Achieve higher education	0.07	0.25	8043
<b>Women's empowerment</b>			
Decides about health care alone or jointly w/ husb.	0.41	0.49	7433
Decides about major HH purchases alone or jointly w/ husb.	0.40	0.49	7428
Decides to visit her family or relative alone or jointly w/ husb.	0.53	0.50	7434
Decides what to do with money husband earns alone or jointly w/ husb.	0.26	0.44	7357
Decides what to do with money she earns alone or jointly w/ husb.	0.93	0.26	4741
Women mainly decides to use contraception alone or jointly w/ husb.	0.12	0.32	7996
<b>Polygamous marriage</b>			
Likelihood to enter a polygamous marriage	0.13	0.34	8043
<b>Employment and Asset ownership</b>			
Women own house alone or jointly w/ husband	0.18	0.39	8038
Women own land alone or jointly w/ husband	0.18	0.39	8034
Currently working	0.67	0.47	8012
Worked in the past year	0.69	0.46	8037
<b>Control variables</b>			
Religion			
Christian	0.41	0.49	8022
Islam	0.57	0.49	8022
Traditional religion	0.01	0.11	8022
Ethnicity			
Yoruba	0.17	0.37	8027
Igbo	0.15	0.35	8027
Haussa	0.33	0.47	8027
Fulani	0.07	0.25	8027
Other ethnicity	0.29	0.46	8027
Area of residence			
Urban	0.40	0.49	8043

Source: Author's estimations based on women module (18-49) from the 2013 Nigeria Demographic Health Survey (DHS).

**Table 2: Effects of Child Marriage Bans on Child Marriage and Age at Marriage**

Outcome	Marriage before age Dummy variables						Age at marriage
	13 (1)	14 (2)	15 (3)	16 (4)	17 (5)	18 (6)	(7)
Child Marr. Intensity	0.418*** (0.0887)	0.684*** (0.206)	0.890*** (0.246)	1.421*** (0.322)	0.682** (0.318)	0.489 (0.387)	-3.586 (3.871)
Under age 18 at ban	-0.102** (0.0410)	-0.145** (0.0540)	-0.199*** (0.0687)	-0.0107 (0.0739)	0.0735 (0.0694)	0.167** (0.0689)	-2.482*** (0.815)
Child Marr. Intensity × Under age 18 at ban	-0.0652 (0.0406)	-0.108** (0.0457)	-0.107** (0.0513)	-0.0913* (0.0486)	-0.00627 (0.0608)	-0.0319 (0.0693)	2.652*** (0.770)
Mean Dep. Var.	0.068	0.139	0.251	0.369	0.460	0.542	18.018
Observations	8,007	8,007	8,007	8,007	8,007	8,007	8,007
Adjusted R-squared	0.052	0.103	0.170	0.252	0.288	0.291	0.298
Age F.E	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module (18-49) from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state-urban-rural level (DHS sampling unit level). \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 3: Effects of Child Marriage Bans on Intimate Partner Violence Against (IPVAW) and husbands' controlling behaviors toward women**

Outcome	Experience physical IPVAV in the past year			Experience IPVAV in the past year		
	Any phys. IPVAW (1)	Less Severe IPVAW (2)	Severe IPVAW (3)	Emotional IPVAW (4)	Sexual IPVAW (5)	Husb. control. behaviors (6)
Child Marr. Intensity	0.0759 (0.225)	0.0797 (0.216)	-0.0237 (0.128)	-0.0248 (0.232)	-0.0163 (0.0958)	0.713 (0.822)
Under age 18 at ban	0.0941** (0.0393)	0.0883** (0.0387)	0.0573*** (0.0137)	0.0557 (0.0361)	0.0164 (0.0137)	0.155*** (0.0566)
Child Marr. Intensity × Under age 18 at ban	-0.131*** (0.0304)	-0.131*** (0.0279)	-0.0483** (0.0189)	-0.0645** (0.0258)	-0.0171 (0.0141)	-0.0943* (0.0475)
Mean Dep. Var.	0.0858	0.0823	0.0334	0.1171	0.0292	0.5804
Observations	7,986	7,988	7,990	7,990	7,984	7,930
Adjusted R-squared	0.060	0.058	0.042	0.154	0.091	0.147
Age F.E	Yes	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module (18-49) from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 4:** *Effects of Child Marriage Bans on Child Marriage and Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – Placebo test: Cohort (28 - 40 years old at policy years)*

Outcome	Age at Marriage (1)	Any phys IPVAW (2)	Emotional IPVAW (3)	Sexual IPVAW (4)	Controlling behaviors (5)
Child Marr. Intensity	-1.844 (6.167)	0.160 (0.316)	-0.208 (0.391)	0.172 (0.117)	0.556 (1.071)
Under age 33 at ban	1.298 (0.882)	0.0149 (0.0341)	0.0876*** (0.0321)	0.00861 (0.0147)	0.157** (0.0626)
Child Marr. Intensity × Under age 33 at ban	-1.310 (0.867)	-0.0189 (0.0244)	-0.0579* (0.0313)	0.0156 (0.0224)	-0.0534 (0.0621)
Mean Dep. Var.	19.312	0.0752	0.1151	0.0234	0.5269
Observations	3,926	3,913	3,917	3,912	3,894
Adjusted R-squared	0.236	0.037	0.120	0.087	0.122
Age F.E	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5:** *Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors | Urban vs. Rural*

	Urban (1)	Rural (2)	p-value of (1) - (2) = 0 (3)
Experience any physical PVAW in the past year	-0.063 (0.048)	-0.186*** (0.042)	0.0513*
Experience any emotional PVAW in the past year	-0.104 (0.070)	-0.097* (0.053)	0.9359
Experience any sexual PVAW in the past year	0.080 (0.058)	-0.050** (0.022)	0.0310**
Experience controlling behaviors by the partner	-0.118 (0.102)	-0.146** (0.066)	0.8110

Source: Author's estimations based on women module (18-49) from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Each specification includes Cohort, State - Urban - Rural, Religion, and Ethnicity fixed effects. Columns (1) and (2) report the treatment effect in urban and rural areas, respectively. Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A1:** *Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – using as a control group women that have between 18 - 49 years old at ban years)*

Outcome	Age at Marriage (1)	Any phys IPVAW (2)	Emotional IPVAW (3)	Sexual IPVAW (4)	Controlling behaviors (5)
Child Marr. Intensity	-1.226 (4.713)	0.188 (0.191)	0.240 (0.256)	-0.0167 (0.0928)	1.242 (0.859)
Under age 18 at ban	-2.746*** (0.812)	0.0849** (0.0372)	0.0481 (0.0362)	0.0201 (0.0126)	0.131** (0.0563)
Child Marr. Intensity × Under age 18 at ban	3.413*** (0.524)	-0.107*** (0.0264)	-0.0450* (0.0264)	-0.0204* (0.0120)	-0.0546* (0.0288)
Mean Dep. Var.	18.562	0.0944	0.1309	0.0314	0.5823
Observations	12,974	12,941	12,951	12,938	12,849
Adjusted R-squared	0.345	0.061	0.148	0.097	0.149
Age F.E	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes

*Source:* Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

*Notes:* Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A2:** *Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – using the median of the pre-ban child marriage intensity)*

Outcome	Age at Marriage (1)	Any phys IPVAW (2)	Emotional IPVAW (3)	Sexual IPVAW (4)	Controlling behaviors (5)
Child Marr. Intensity med	-2.501*** (0.501)	0.0701** (0.0286)	0.0683*** (0.0245)	0.0215* (0.0118)	0.246*** (0.0535)
Under age 18 at ban	-1.884** (0.731)	0.0752** (0.0345)	0.0547 (0.0333)	0.0118 (0.0123)	0.138** (0.0558)
Child Marr. Intensity med × Under age 18 at ban	1.606*** (0.447)	-0.0961*** (0.0189)	-0.0599*** (0.0192)	-0.00951 (0.0103)	-0.0619** (0.0287)
Mean Dep. Var.	18.018	0.0858	0.1170	0.0291	0.5803
Observations	8,007	7,986	7,990	7,984	7,930
Adjusted R-squared	0.298	0.062	0.155	0.091	0.147
Age F.E	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes

*Source:* Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

*Notes:* Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A3: Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – excluding regions affected by Boko Haram)**

Outcome	Age at Marriage (1)	Any phys IPVAW (2)	Emotional IPVAW (3)	Sexual IPVAW (4)	Husb. Controlling behaviors (5)
Child Marr. Intensity	-9.575*** (1.345)	-0.0356 (0.0764)	-0.110 (0.0787)	-0.0915* (0.0461)	-0.546** (0.205)
Under age 18 at ban	-2.457*** (0.895)	0.0817* (0.0411)	0.0433 (0.0340)	0.0231* (0.0124)	0.180*** (0.0564)
Child Marr. Intensity × Under age 18 at ban	3.027*** (0.837)	-0.109*** (0.0261)	-0.0539** (0.0259)	-0.0148 (0.0120)	-0.113** (0.0504)
Mean Dep. Var.	18.018	0.0858	0.1170	0.0291	0.5803
Observations	6,865	6,848	6,851	6,848	6,819
Adjusted R-squared	0.314	0.062	0.093	0.026	0.120
Age F.E	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A4: Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – Using continuous measurement of IPVAW and husband controlling behaviors)**

Outcome	Any phys IPVAW (1)	Emotional IPVAW (2)	Sexual IPVAW (3)	Husb. controlling behaviors (4)
Child Marr. Intensity	-0.00627 (0.603)	-0.136 (0.452)	-0.0178 (0.193)	2.734 (1.693)
Under age 18 at ban	0.237*** (0.0831)	0.0774 (0.0740)	0.00348 (0.0312)	0.313** (0.128)
Child Marr. Intensity × Under age 18 at ban	-0.306*** (0.0750)	-0.0853 (0.0579)	-0.0241 (0.0269)	-0.181* (0.0952)
Mean Dep. Var.	0.1954	0.2027	0.0475	1.0435
Observations	7,986	7,990	7,984	7,930
Adjusted R-squared	0.053	0.117	0.087	0.099
Age F.E	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A5:** *Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – I included additional control variables to account for potential interruptions during the interview process caused by the presence of certain individuals in the household, such as adult females, husbands, or adult males in the family.)*

Outcome	Age at Marriage (1)	Any phys IPVAW (2)	Emotional IPVAW (3)	Sexual IPVAW (4)	Controlling behaviors (5)
Child Marr. Intensity	-3.277 (3.768)	0.101 (0.227)	-0.0198 (0.234)	-0.00854 (0.0995)	0.750 (0.828)
Under age 18 at ban	-2.679*** (0.824)	0.0953** (0.0391)	0.0571 (0.0362)	0.0170 (0.0139)	0.145** (0.0585)
Child Marr. Intensity × Under age 18 at ban	2.733*** (0.764)	-0.131*** (0.0305)	-0.0671** (0.0262)	-0.0175 (0.0145)	-0.0946* (0.0481)
Mean Dep. Var.	18.018	0.0858	0.1170	0.0291	0.5803
Observations	7,945	7,928	7,931	7,926	7,871
Adjusted R-squared	0.301	0.062	0.153	0.090	0.147
Age F.E	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A6:** *Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – Instead of using 2003 as the year the child marriage ban was introduced, I use the staggered rollout of the child marriage ban to identify individuals who are exposed to the policy)*

Outcome	Age at Marriage (1)	Any phys IPVAW (2)	Emotional IPVAW (3)	Sexual IPVAW (4)	Husb. controlling behaviors (5)
Child Marr. Intensity	-4.845 (4.887)	0.0291 (0.214)	-0.0430 (0.301)	0.0133 (0.0789)	0.745 (0.881)
Under age 18 at ban	-2.390* (1.250)	0.161*** (0.0580)	0.0296 (0.0692)	-0.0173 (0.0262)	0.183** (0.0695)
Child Marr. Intensity × Under age at ban	4.711*** (0.750)	-0.145*** (0.0395)	-0.0946** (0.0352)	0.00487 (0.0159)	-0.0751 (0.0503)
Mean Dep. Var.	18.5241	0.0833	0.1221	0.0275	0.5702
Observations	7,874	7,855	7,859	7,852	7,804
Adjusted R-squared	0.330	0.049	0.147	0.102	0.145
Age F.E	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A7: Effect of Child Marriage Bans on Intimate Partner Violence Against Women (IPVAW) and husbands' controlling behaviors – Instead of considering women who have ever been married, I restrict the sample to women who are currently married at the time of the survey.)**

Outcome	Any phys IPVAW (1)	Emotional IPVAW (2)	Sexual IPVAW (3)	Husb. controlling behaviors (4)
Child Marr. Intensity	0.226 (0.198)	0.0411 (0.210)	-0.00936 (0.0854)	0.743 (0.790)
Under age 18 at ban	0.0568 (0.0478)	0.0202 (0.0388)	0.00901 (0.0132)	0.135** (0.0539)
Child Marr. Intensity × Under age 18 at ban	-0.106*** (0.0296)	-0.0427 (0.0271)	-0.0129 (0.0117)	-0.0875* (0.0499)
Mean Dep. Var.	0.084	0.193	0.046	0.5819
Observations	7,398	7,401	7,396	7,344
Adjusted R-squared	0.060	0.165	0.090	0.151
Age F.E	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes

Source: Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table B1: Effect of Child Marriage Bans on education**

Outcome	Ever attended school (1)	Achieve higher education (2)
Child Marr. Intensity	-1.196*** (0.336)	0.436** (0.192)
Under age 18 at ban	0.0895 (0.0667)	-0.0411 (0.0278)
Child Marr. Intensity × Under age 18 at ban	-0.0118 (0.0584)	0.0559** (0.0229)
Mean Dep. Var.	0.538	0.066
Observations	8,007	8,007
Adjusted R-squared	0.615	0.102
Age F.E	Yes	Yes
State F.E	Yes	Yes
Religion F.E	Yes	Yes
Ethnicity F.E	Yes	Yes

Source: Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

Notes: Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table B2: Effect of Child Marriage Bans on employment and asset ownership**

VARIABLES	Employment			Asset ownership	
	Worked in the past year	Currently Working	Have a apid in work	Women own land alone or jointly w/ husband	Women own house alone or jointly w/ husband
	(1)	(2)	(3)	(4)	(5)
Child Marr. Intensity	-0.817** (0.311)	-0.796** (0.324)	-0.362* (0.213)	-0.781** (0.294)	-1.595*** (0.377)
Under age 18 at ban	-0.403*** (0.0505)	-0.436*** (0.0532)	-0.0952 (0.0577)	-0.170*** (0.0513)	-0.254*** (0.0716)
Child Marr. Intensity × Under age 18 at ban	0.0547 (0.0653)	0.107 (0.0689)	0.0728** (0.0306)	0.165*** (0.0417)	0.252*** (0.0414)
Observations	8,001	7,976	5,668	7,998	8,002
Adjusted R-squared	0.249	0.249	0.119	0.155	0.211
Age F.E	Yes	Yes	Yes	Yes	Yes
State F.E	Yes	Yes	Yes	Yes	Yes
Religion F.E	Yes	Yes	Yes	Yes	Yes
Ethnicity F.E	Yes	Yes	Yes	Yes	Yes

*Source:* Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

*Notes:* Standard errors are clustered at the state - urban - rural level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table B3: Effect of Child Marriage Bans on women's bargaining power within the household**

Outcome	High Child Mar. Inten.* under age 18 at ban (1)	N (2)	Mean Dep. Var. (3)
Decides about health care alone or jointly w/ husb.	0.160*** (0.042)	7,399	0.407
Decides about major HH purchases alone or jointly w/ husb.	0.234*** (0.029)	7,394	0.398
Decides to visit her family or relative alone or jointly w/ husb.	0.076* (0.040)	7,400	0.525
Decides what to do with money husband earns alone or jointly w/ husb.	0.144*** (0.041)	7,325	0.262
Decides what to do with money she earns alone or jointly w/ husb.	0.029 (0.030)	4,724	0.927
Woman make decision for using contraception earns alone or jointly w/ husb.	0.076** (0.036)	7,960	0.120

*Source:* Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

*Notes:* Standard errors are clustered at the state - urban - rural level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$



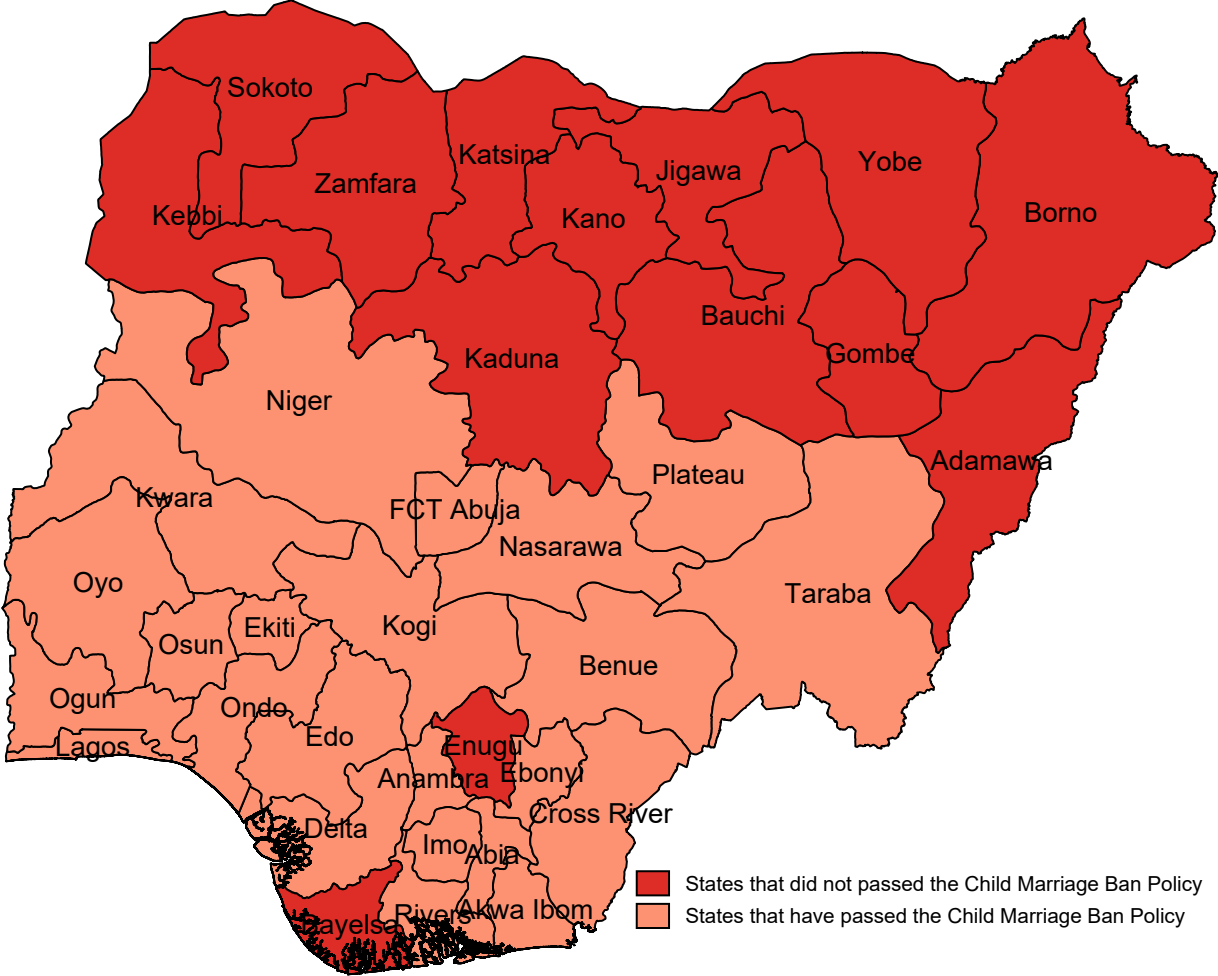
**Table B4:** *Effect of Child Marriage Bans on Women likelihood to enter a polygamous marriage*

Varriable	(1)
Child Marr. Intensity	0.709*** (0.233)
Under age 18 at ban	-0.0332 (0.0247)
Child Marr. Intensity × Under age	-0.140*** (0.0341)
Mean Dep. Var.	0.132
Observations	8,007
Adjusted R-squared	0.153
Age F.E	Yes
State F.E	Yes
Religion F.E	Yes
Ethnicity F.E	Yes

*Source:* Author's estimations based on women module from the 2013 Nigeria Demographic Health Survey (DHS). The intensity of child marriage is calculated from the 2003 Nigeria Demographic Health Survey (DHS) using women who were not affected by the policy, i.e. women aged 19-49.

*Notes:* Standard errors are clustered at the state - urban - rural level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Figure 2:** Map showing the states that implemented a policy banning early marriages between 2003 and 2013.



Source: Partner West Africa Nigeria (PWAN)

**Table C1:** Measures of the outcome variables – Intimate Partner Violence Against Women (IPVAW): Binary and continuous measures.

	Binary measure	Continuous measure
<b>Physical partner violence in the past 12 months</b>	Yes=1, No=0	0-7
<b>Less severe Physical partner violence in the past 12 months</b>	Yes=1, No=0	0-4
Spouse pushed, shook or threw something?	Yes=1, No=0	
Spouse slapped?	Yes=1, No=0	
Spouse punched with fist or something harmful?	Yes=1, No=0	
<b>Less severe Physical partner violence in the past 12 months</b>	Yes=1, No=0	0-3
Spouse kicked or dragged?	Yes=1, No=0	
Spouse tried to strangle or burn?	Yes=1, No=0	
Spouse threatened with knife/gun or other weapon?	Yes=1, No=0	
Spouse twisted her arm or pulled her hair?	Yes=1, No=0	
<b>Emotional partner Violence in the past 12 months</b>	Yes=1, No=0	0-3
Spouse humiliated you?	Yes=1, No=0	
Spouse threatened you with harm	Yes=1, No=0	
Spouse insulted you?	Yes=1, No=0	
<b>Sexual partner Violence in the past 12 months</b>	Yes=1, No=0	0-3
Spouse physically forced sex when not wanted?	Yes=1, No=0	
Spouse physically forced to perform sexual acts you didn't want to?	Yes=1, No=0	
Spouse forced other sexual acts when not wanted?	Yes=1, No=0	
<b>Husband's controlling behaviors women in the past 12 months</b>	Yes=1, No=0	0-5
Partner expressing jealousy when she interacts with other men	Yes=1, No=0	
Partner accusing wife of infidelity,	Yes=1, No=0	
Partner restricting wife from socializing with female friends	Yes=1, No=0	
Partner limiting wife contact with family	Yes=1, No=0	
Partner insisting on knowing wife whereabouts at all times	Yes=1, No=0	

Source: Author's elaboration.

Notes: Binary indicator for capturing Intimate Partner Violence Against Women (IPVAW): This variable is assigned a value of 1 if the respondent reports experiencing IPVAW in the 12 months prior to the survey, categorized as occurring often, sometimes, or frequently. Conversely, the variable is assigned a value of 0 if the respondent indicates never experiencing IPVAW or experiencing it but not within the past 12 months.

Continuous IPVAW measurement: The continuous gauge of Intimate Partner Violence Against Women (IPVAW) is derived from the cumulative sum of variables designed to encompass each category of IPVAW (physical, emotional, and sexual), along with indicators for husband's controlling behaviors.

**Table C2:** *Years in which the child marriage ban was enacted at state level.*

States	Year the state enacted the child marriage ban
1. FCT	Assented to on 31st July 2003
2. Abia	Assented in 2006
3. Adamawa	Not assented
4. Akwa-Ibom	Assented in 2008
5. Anambra	Assented in 2004
6. Bauchi	Not assented
7. Bayelsa	Assented to on 6th May 2016
8. Benue	Assented to on 18th November 2008
9. Borno	Assented to on 10 Jan 2022
10. Cross Rivers	Assented in 2008
11. Delta	Assented in 2008
12. Ebonyi	Assented in 2010
13. Edo	Assented in 2007
14. Ekiti	Assented in 2006
15. Enugu	Assented to in August 2016
16. Gombe	Not assented
17. Imo	Assented to on 4th August 2004
18. Jigawa	Assented to on 22 Dec 2021
19. Kaduna	Assented to in March 2018
20. Kano	Assented to on 24 May 2023
21. Katsina	Assented to on 11 Jan 2021
22. Kebbi	Assented to on 8 Aug 2022
23. Kogi	Assented to in 2007
24. Kwara	Assented to in 2005
25. Lagos	Assented to in 2007
26. Nasarawa	Assented to in 2005
27. Niger	Assented to in 2010
28. Ogun	Assented to in 2006
29. Ondo	Assented to in 2007
30. Osun	Assented to in 2007
31. Oyo	Assented to in 2006
32. Plateau	Assented to in 2005
33. Rivers	Assented to in 2009
34. Sokoto	Assented to on 23 Nov 2021
35. Taraba	Assented to in 2005
36. Yobe	Assented to on 27 May 2022
37. Zamfara	Assented to on 16 Aug 2022

Source: Partners West Africa Nigeria (PWAN). Information available here: <https://www.partnersnigeria.org/childs-rights-law-tracker/>.