The Effects of Civil War and Forced Migration on Intimate Partner Violence among Syrian Refugee Women in Jordan*

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Abstract

This study investigates the impact of the Syrian civil war and refugee status on the risk of physical intimate partner violence (IPV) among Syrian women in Jordan, the country with the second highest refugee-to-native ratio worldwide. We analyze data from the 2017-18 Jordan Population and Family Health Survey, which includes a nationally representative sample of Syrian refugees. Using the information *on the timing of first violence after marriage* within a discrete-time duration analysis, we examine the hazard rates of IPV exposure across different periods: prewar Syria, postwar Syria, and refugee status. Our findings demonstrate that war and refugee status increase the risk of IPV, and these findings persist for women who were married before the civil war. Additionally, the rise in IPV after the refugees' arrival in Jordan diminishes over time. The study identifies the economic strain resulting from lower household wealth and refugee husbands' employment losses as a driver of the rise in IPV. Moreover, our innovative approach utilizing GPS locations of refugee households to calculate refugee density reveals that greater social isolation, indicated by reduced proximity to other refugees, significantly exacerbates the risk of IPV among these women. In addition, we explore whether the civil war and refugee status alter marriage patterns, which could contribute to the observed effects on IPV. Both the civil war and forced migration lower the marriage age and increase the incidence of non-cousin marriages at the expense of cousin marriages—both of which are associated with a higher risk of IPV.

Keywords: Syrian refugees, forced migration, intimate partner violence, physical violence, war and displacement, Jordan.

1. Introduction

Violence against women within intimate relationships presents a significant public health issue and constitutes a violation of women's human rights. Worldwide, almost 27% of women aged 15-49 in a relationship report that they have been subjected to physical and/or sexual violence by their intimate partner in their lifetime (WHO, 2018). The prevalence of lifetime physical or sexual IPV is also high and more than the global average in developing countries, specifically in the Middle East (Sardinha et al., 2022).

Intimate partner violence (IPV) causes physical and emotional traumas strongly correlated with poorer physical, mental, sexual, reproductive health, and economic outcomes throughout women's lives (WHO, 2012). Physically, IPV results in trauma, worsens chronic health conditions, and hinders access to medical care (Lutgendorf, 2019; Stubbs and Szoeke, 2022). Mentally, victims face heightened risks of depression, anxiety, post-traumatic stress disorder, and suicidal tendencies (Ellsberg et al., 2008; Miller & McCaw, 2019). Regarding sexual and reproductive health outcomes, Hutchinson et al. (2023) find that women who report IPV have higher odds of facing sexually transmitted infections, endometriosis, infertility, pregnancy termination, and miscarriage. Intergenerational effects of IPV against pregnant women also exist in the form of lower birth weight (Aizer, 2011). When it comes to economic outcomes throughout women's lives, IPV is associated with decreased employment stability, higher job turnover, and lower wages due to stress-related psychological and physical consequences (Crowne et al., 2011; Sabia et al., 2013). Moreover, IPV increases work distraction and absenteeism, further affecting productivity (Reeves and O'Leary-Kelly, 2007; Swanberg et al., 2006). Expanding on the economic impact, IPV incurs significant economic costs, including healthcare expenses, social service fees, and legal costs. These economic burdens extend beyond immediate costs, impacting future human capital formation and contributing to intergenerational cycles of disadvantage. Studies from developed and developing countries reveal annual costs in the billions (EIGE, 2021).[1]

[1] For example, Canada faces costs exceeding CAN$4.2 billion annually, and the UK faces £23 million (Greaves et al., 1995; Walby, 2004). Max et al. (2004) estimate the economic cost in the US at $8.3 billion in 2003 dollars. In developing countries, IPV costs represent significant portions of GDP, such as over 2% in Chile and 2.05% in Bangladesh (Morrison and Orlando 1999). These expenses often surpass national spending on primary education, underscoring the severe economic impact of IPV worldwide (World Bank, 2013).

The Middle East region has experienced wars and, as a result, a dramatic flood of refugees and forced migration over the past 15 years. Syria experienced the world's largest refugee crisis. The UN Refugee Agency reports that more than 6.8 million Syrians have fled their country since 2011. The vast majority, approximately 5.2 million people, have found refuge in neighboring countries, including Jordan. Jordan stands out as the country with the second highest proportion of refugees in its population globally, with the refugee/native share reaching nearly 9%. Syrians who have resettled in Jordan have undergone substantial changes in their living conditions, similar to other refugee populations. Prior research has explored the effects of displacement on Syrian refugees' working conditions, education, and health outcomes (Demirci et al., 2022; Demirci & Kırdar, 2023; Kırdar et al., 2023; Krafft et al., 2022). However, it has not been investigated whether women who experienced the civil war and subsequently became refugees are more susceptible to spousal violence in their new lives. This study aims to address this research gap by examining the impact of civil conflict and forced displacement on the likelihood of experiencing physical IPV among Syrian refugees in Jordan.

We utilize data from the 2017-18 Jordan Population and Family Health Survey (JPFHS), which provides a representative sample of Syrian refugees in Jordan. This survey offers comprehensive information on women's experiences of IPV and detailed background characteristics of both the women and their husbands, including nationality, age, education, employment, age at marriage, and place of residence. The key and interesting piece of information in the JPFHS is the timing of the first physical violence episode women faced from their husbands (in the number of years since marriage). This information allows us—using duration analysis—to investigate how refugee women's IPV exposure is impacted by two critical junctures in their lives: (i) the civil war in Syria and (ii) refugee status in Jordan. Specifically, we employ a discrete-time duration analysis that allows for unobserved heterogeneity, tracking refugee women's IPV *hazard rates*[2] after marriage across different periods in their lives, including prewar Syria, postwar Syria, and their time in Jordan as refugees. Although our study focuses on physical violence (as the

[2] IPV hazard rate at age *a* for a woman is the probability that this woman faces IPV at age *a* conditional on not having faced IPV until age *a*.

information on the timing of the first episode is available only for this type of violence), the JPFHS data show that physical violence is highly correlated with other types of violence against women.[3]

We find that both the civil war and refugee status increase the risk of IPV among Syrian women. When we allow the effects of war and refugee status on IPV to vary by the waiting time in our duration analysis (years since marriage), we find that both effects diminish over the waiting time. Statistical evidence of an impact exists during the first six years of marriage for refugee status and the first four years for civil war. The magnitudes of the impacts during these years are substantial; for instance, during the first year of marriage, the IPV probability increases by 90% due to refugee status and by 71% due to civil war. We also find that these are not merely tempo effects, where IPV happens earlier in the marriage rather than later. The fraction of women who are never exposed to IPV during their marriage lives also drops due to civil war and refugee status. When we allow the effect of refugee status to change by the duration of residence in Jordan, we find that the impact of refugee status precipitously declines over the time spent in Jordan. While refugee status increases the IPV probability by more than 300% in the first year in Jordan, this increase is 130% in the second year and 67% in the third year. No statistical evidence of an effect remains after three years in Jordan.

The estimated increase in IPV rates could partly result from compositional effects if marriages formed after the war or migration to Jordan differ from those formed earlier in important ways. Marriages taking place after the civil war and in refugee status might carry higher risks of violence due to factors like age at marriage, marriage type, or husband characteristics. We restrict the sample to women married before the civil war to investigate this issue. The evidence regarding the impact of the civil war and refugee status persists; however, the coefficients are slightly smaller, and the statistical significance is lower. Another potential confounder in our analysis is the presence of recall bias. Younger women may report higher rates of IPV than middle-aged women due to recall bias. In order to reduce the impact of potential recall bias, we narrow our

[3] Online Appendix Table A1 compares various indicators between women who have been subjected to physical violence and those who have never experienced it among Syrian refugee women in Jordan. The results show that women who have experienced physical violence are more likely to encounter controlling behaviors and higher rates of emotional violence. For example, 69% of women who have been exposed to physical violence report also experiencing emotional violence, while only 8% of women in the other group do. Furthermore, these women have significantly less influence in making decisions within the household.

focus to events experienced by younger women at the survey date and women who have been married more recently at the survey date. Our findings persist in these cases, with slightly larger estimated effects for both civil war and refugee status.

We investigate the potential mechanisms that could lead to the observed increase in IPV among refugees. Using data from prewar Syria and the JPFHS, we show that the rise in IPV is likely to result from the deteriorating household economic conditions after forced migration—evidenced by the loss of asset holdings and declining employment rates. In addition, we show that the increase in IPV is more pronounced for subpopulations for which the decline in household economic conditions is more acute. In particular, refugee men with lower educational attainment experience a more significant loss of employment compared to those with higher educational backgrounds, and the rise in IPV is particularly evident among women whose husbands have lower educational qualifications. These findings support the role of employment loss and economic hardships in the observed rise in IPV.

A key finding of our study is regarding the role of social isolation in the rise of IPV among Syrian refugees. Given the displacement and resettlement, these women often experience a significant reduction in their social support networks. This loss of proximity to familiar social structures, such as neighbors, relatives, and friends from their homeland, can exacerbate their vulnerability to IPV. Utilizing GPS data from the 2017-18 JPFHS, we examine the density of Syrian households around each refugee to proxy for social support levels. Our findings reveal a significant inverse relationship between social support and IPV risk, highlighting the critical role of robust social networks in protecting displaced women from partner violence.

Civil war and refugee status might also affect IPV via their influences on marriage patterns, although we show that their impacts on marriage alone do not account for their effects on IPV, as discussed above. To explore this issue further, we analyze changes in marriage outcomes resulting from the civil war and forced migration. Our results show a significant increase in the marriage hazard rate in Jordan and postwar Syria compared to prewar Syria.[4] The existing literature suggests that spousal violence is less likely in cousin marriages, while higher rates of violence have been

[4] Similarly, Foster et al. (2023) find a rise in the marriage hazard rates of Syrian refugees in Turkey during the civil war and under refugee status in Turkey. Krafft et al. (2024) examine how conflicts affect girl child marriage across 19 conflict-affected countries and reach mixed results.

associated with polygamous marriages. Additionally, when there is a significant age or educational disparity between spouses, the likelihood of violence against women increases due to women's lower bargaining power. With this knowledge in mind, we proceed to examine the impact of war and forced migration on different types of marriages, including cousin and polygamous marriages, as well as marriages with significant age and educational disparities.

Our analysis reveals that the rise in non-cousin marriages is more substantial compared to cousin marriages, and the former is known to be associated with a higher risk of violence. This significant increase in non-cousin marriages may play a role in the observed rise in IPV rates among Syrian refugees in Jordan. However, we find no statistically significant effect of war and refugee status on the occurrence of polygamous marriages, nor do we observe a greater power imbalance in terms of age and education differences between spouses in marriages occurring in Jordan compared to pre-war Syria.

2. Related Literature

The previous literature that has examined the impact of conflict on IPV overwhelmingly reports a positive relationship.[5] While most of these studies establish associations between the two outcomes,[6] some also exploit regional variation in conflict intensity to estimate the causal effect of conflict on IPV (Ekhator-Mobayode et al., 2022; Gutierrez and Gallegos, 2016; Noe and Rieckman, 2013; La-Mattina, 2015; Ostby, 2016).[7] The latter group of studies are either in the context of sub-Saharan Africa or Latin America. Overall, these studies illustrate that organized violence at the societal level can be transmitted to interpersonal relationships, impacting IPV rates.

[5] An exception is Robertson and Crouse (2004).

[6] See, for instance, Clark et al. (2010), Falb et al. (2013), Gupta et al. (2009, 2012), Kelly et al. (2018), and Saile et al. (2013).

[7] For instance, Østby (2016) analyzes 17 Sub-Saharan African countries and finds that armed conflict has negative consequences for sexual violence in the private sphere. Eseosa Ekhator-Mobayode et al. (2022) utilize a quasi-experimental methodology to investigate the impact of the Boko Haram insurgency on IPV in Nigeria, finding a significant increase in the likelihood of women experiencing physical or sexual IPV in the presence of Boko Haram. Gutierrez and Gallegos (2016) find that exposure to internal conflict during childhood and adolescence increases the likelihood of being a victim of domestic violence as an adult in Peru.

Another branch of the literature suggests that the prevalence of IPV is high among forcibly displaced communities. Many qualitative or small-scale case studies conducted in both camp and non-camp settings investigate the odds of IPV and observe that the leading causes behind high levels of IPV include social isolation and financial stress.[8] Using quantitative data on Colombian refugees in Ecuador, Keating et al. (2021) examine how IPV is correlated with several measures of previous trauma, social isolation, and economic instability. In a working paper, Calderon et al. (2011) discuss the impact of forced migration on IPV, women's labor force participation, and intra-household bargaining power. Using regional variation in rainfall as an instrument for forced migration status (internal displacement) in the Colombian conflict, they find no evidence of an impact of forced migration on IPV.

Our study makes several unique contributions to the existing literature. First, previous research on IPV among displaced communities has largely relied on qualitative or small-scale case studies due to data limitations, but our study utilizes a nationally representative dataset. Secondly, existing studies have primarily focused on establishing associations between forced displacement and IPV, lacking empirical evidence to support causal relationships. The 2017-18 JPFHS provides an ideal basis for measuring the impact of civil war and forced migration on the frequency of IPV, mainly because it includes a domestic violence module consisting of information on the timing of the first violent act. This allows us to compare individuals at three different locations and time frames (Syria before the war, Syria after the war, and Jordan under refugee status) to find the impacts of civil war and refugee status under the assumption that the timing of arrival in Jordan is unrelated to potential IPV outcomes. Third, the existing studies on this topic do not focus on refugees' experiences in the context of the Middle East. In contrast, our study specifically investigates the impact of Syrian conflict-induced displacement, which represents the largest refugee crisis in the modern world. Lastly, a notable gap in the existing literature is the lack of focus on potential mechanisms contributing to the change in IPV rates due to conflict and forced migration.

This study also uncovers the underlying mechanisms that may drive the observed changes in IPV rates. A growing body of literature highlights that economic distress and financial insecurity

[8] See, e.g., Horn (2010), Hyman et al. (2008), Poteyeva and Wasileski (2016), Szczepanikova (2005), Sharma et al. (2020), Wirtz et al. (2014).

contribute to tension and conflict within relationships, leading to a higher likelihood of violence.[9] Some studies causally examine the relationship between adverse labor market conditions and women's experiences of abusive behavior and find that male unemployment increases the likelihood of experiencing physical violence (Clerici & Tripodi, 2021; Schneider et al., 2016). In conflict and forced migration, barriers to employment often arise, making it challenging for men to fulfill the traditional role of being the primary breadwinner and protector of the family (Henny et al., 2012; Tur-Prats, 2017). A recent and growing literature examines the impact of cash transfers on IPV, many of which find that IPV falls in cash transfers (Bobonis et al., 2013; Heath et al., 2020; Hidrobo et al., 2016; Lees et al., 2021; Roy et al., 2024). The key mechanism is that cash transfers reduce stress and anxiety in the household as they can afford better food, health care, and education.[10] Overall, this literature implies that the worsening financial conditions of refugee families during the war and in refugee status would elevate IPV.

At the same time, the deteriorating labor market conditions for refugees, which mainly affect men because of women's limited participation in the labor market, suggest a smaller gender pay gap. Aizer (2010) discovers that as the gender pay gap decreases in the US, IPV also drops. Similarly, Perova et al. (2023) find that greater wage equality leads to a reduction in IPV in low-income areas of Brazil, particularly among younger women who may find it challenging to leave abusive relationships. This scenario is similar to the situation faced by refugees. Therefore, one could anticipate a decrease in IPV. However, our study shows that this effect is overshadowed by the impact of increased stress and anxiety in refugee households as a result of financial losses during conflict and forced migration.

Another factor why forced migration may lead to an increase in IPV risk can be the social isolation of refugee women. Social support, particularly from friends and family, is crucial in protecting against IPV (Wright, 2015; Dias et al., 2019). This support encompasses practical

[9] Angelucci and Heath (2020), Benson et al. (2003), Bhalotra et al. (2021), Buller et al. (2016), Buzawa and Buzawa (2013), Clark et al. (2010), Jewkes (2002), Lucero et al. (2016), Matjasko et al. (2013).

[10] Here, a key issue is whether men or women receive the cash transfers because other mechanisms emerge when transfers are provided to women—including intrahousehold conflict and women's empowerment. Angelucci (2008) and Hidrobo and Fernald (2013) find mixed results, in which IPV rises in certain settings (depending on the power structure between the man and the women and the size of the transfer). Haushofer et al. (2019) find that transfers to men reduce physical violence against women. Buller et al. (2018) provide a review of this literature.

assistance and emotional care, which can significantly mitigate stress and promote well-being. Additionally, the presence of social support has been linked to increased help-seeking behavior among IPV victims, providing them with vital resources to escape abusive situations (Wright, 2015) A lack of social support is especially a concern for refugee women, who moved into a new environment—leaving their previously established support networks. Muruthi et al. (2023) report increases in IPV among African immigrant women in the US, attributed to the erosion of traditional support structures and ensuing isolation in their new environment. Moreover, refugees might have a difficult time establishing new social networks.[11]

Previous studies that established an association between social support and IPV use measures of social support from family and friends. However, these measures of social support could themselves be affected by IPV, resulting in a simultaneity problem. For instance, a woman facing IPV might isolate herself from her friends. In addition, the quality and type of relationships with family and friends might stand for personality traits. For instance, an extrovert woman might have better relationships with family and friends but also might be better able to fend herself against IPV. In this case, the IPV-preventing effect that we attribute to social support stands for a personality trait. Our setting and rare data about the GPS locations of refugee women prevent these identification problems. Under the assumption that refugees' settlement patterns are independent of their IPV propensity, conditional on covariates and permanent unobserved characteristics, our setting approximates a setting in which refugee women are allocated into different parts of a new country where they have no preexisting social support. We approximate their current social support with other refugees' geographical distance and concentration. Therefore, we come much closer to estimating the causal effect of women's social support on IPV they face.

Another important distinguishing feature of our study is that we investigate the effects of the civil war and the refugee status on marriage outcomes as a mechanism for the impact of conflict and refugee status on IPV. This is important because the effects we measure on IPV could result solely from a change in the composition of married women in our sample. We show that this is not the case in our setting. Although we do find an impact of the civil war and the refugee status on marriage outcomes, we also illustrate their direct effects on IPV outcomes—by conducting our

[11] Stillman et al. (2022) note that over 25% of Syrian refugee minors residing in Jordan lacked friendships with Jordanian peers and had no access to communal play areas alongside children from Jordan.

analysis using a sample of refugee women whose marriages took place before the start of the civil war. Although this issue—changes in the sample composition of married women due to conflict or refugee status—is as essential in the earlier studies examining the impact of conflict or refugee status on IPV outcomes or the impact of cash transfers on IPV, it is mostly ignored. An exception is La Mattina (2017), who examines how the change in sex ratios due to the genocide in Rwanda alters marriage sorting and, hence, women's bargaining power in the marriage—leading to changes in the IPV risk. However, while La Mattina (2017) finds that IPV increases significantly more for women who married after the conflict than for women who married earlier, we find that refugee status also has an important impact on women who married before the civil war.

3. Background Information

After the protests against the government that started in March 2011 got out of hand and eventually transformed into a nationwide war in Syria, Syrians began fleeing to neighboring countries in order to save their lives. Since 2011, more than 14 million Syrians have been forced to leave their homes in search of safety. Currently, there are still over 6.8 million Syrians displaced within their own country. Most Syrians seeking refuge in other countries are hosted by neighboring countries, specifically Turkey, Jordan, and Lebanon, accounting for over 80% of the total number.

Most Syrian refugees in Jordan arrived in 2012 and 2013. UNHCR reports that the number of total registered Syrian refugees in Jordan was 656,722 as of January 2018, when the interviews for the 2018 JPFHS were concluded. The number of refugees in Jordan is approximately 9% of the native population, the second-highest share of refugees globally (UNHCR, 2018). However, the number of Syrian refugees registered with the UNHCR is lower than the actual figure due to difficulties in documentation and registration. According to the 2015 Jordanian Census, there were 1.3 million Syrians, most of whom arrived after the Syrian civil war (General Population and Housing Census, 2015).

Only one-fifth of the Syrian refugee population lives in camps, while the remaining majority lives in host communities. Approximately 90% of Syrian refugees reside in the governorates of Amman, Mafraq, Irbid, and Zarqa. The Syrian refugees in Jordan constitute a very young population; 48% are under the age of 17. When broken down by gender, the refugee

population maintains a balanced distribution regarding the number of males and females (UNHCR, 2023).

Due to the absence of official statistics, we rely on surveys to obtain insights into the education level and employment status of Syrian refugees in Jordan. Based on JPFHS 2017-18 data, Syrian refugees in Jordan possess significantly lower education levels than the national average in Jordan. For individuals aged 18–65, the percentage of Jordanian males and females without formal education stands at 1.9 and 4.0, respectively. In contrast, the respective figures for Syrian males and females are 5.1 and 12.0, indicating a higher percentage of individuals without any formal education among Syrians. Conversely, the percentage of Jordanian males and females with an education level of high school or above stands at 36.8 and 41.8, respectively, while the corresponding figures for Syrian males and females are 12.3 and 10.0, suggesting a lower percentage of individuals with higher education among Syrians.

Next, we briefly discuss refugee's labor market conditions. Most Syrian refugees residing in Jordan could only acquire work permits after 2016. As part of the Jordan Compact, Syrian refugees gained the opportunity to acquire yearly work permits, enabling them to engage in legal employment within Jordan from the beginning of 2016 (European Commission, 2016). However, despite the implementation of the work permit program, the proportion of Syrian refugees actively participating in the labor force remains low. Calculations based on JLMPS 2016 reveal that the overwhelming majority of working-age Syrian refugee adults (aged 15–64) were out of the labor force. Specifically, only 45% of men and 4% of women among Syrian refugees are currently part of the labor force (Krafft and Sieverding, 2018). In 2016, 55% of Jordanian men and 38% of Syrian refugee men were employed. Among women, just 11% of Jordanian women and 3% of Syrian refugee women were working (Krafft et al., 2018).

UNHCR estimates that over 85% of Syrian refugees in Jordan reside below the poverty line as of 2018 (UNHCR, 2018). Syrian refugees in Jordan face limited financial resources, high levels of debt, and limited employment opportunities. As a result, the majority heavily rely on humanitarian aid for their basic needs and livelihoods (UNHCR, 2022).

4. Data

The data come from the 2017-18 Jordan Population and Family Health Survey (JPFHS) implemented by the Jordan Department of Statistics from early October 2017 to January 2018. The JPFHS uses multi-stage stratified sampling to select households based on the sampling frame of the 2015 Jordan Population and Housing Census. The JPFHS is representative of the country as a whole, of urban and rural areas separately, of 12 administrative governorates, and of three national groups: Jordanians, Syrians, and a group combined from various other nationalities. The data provide the first-ever nationally representative household-level demographic and health indicators of the Syrian refugees living in Jordan. The JPFHS has a very high response rate at the national level (99% in women interviews). Tablets were used to collect data during interviews to record responses and data transfer, which positively affected data quality. In addition, we use two complementary data sets to provide background information on Syrian women before arriving in Jordan: the 2009 Syria Family Health Survey (SFHS) and the 2006 Syria Multiple Indicators Survey (SMICS). Also, we use information regarding the number of Syrian refugees in Jordan by governorates and the origins of Syrian refugees obtained from the official reports of the UNHCR.

The JPFHS includes a module on women's safety to obtain data on ever-married women's experience of emotional, physical, and sexual violence. In a subsample of half of the households, a domestic violence module was applied to one ever-married woman aged 15-49 selected randomly from each household. The module was administered only if complete privacy could be assured. In total, 6,852 women were asked questions about violence against them; less than 1% of eligible women could not be successfully interviewed, mainly due to lack of privacy.

The JPFHS covers rich information on the background characteristics of the woman and her husband, including nationality, age, education, employment, age at marriage, and place of residence. The survey also provides information on the number of years lived in the current place of residence, which we use to calculate Syrian refugees' year of arrival in Jordan. Because this study focuses on the effect of Syrian inflow caused by the civil war, which began in 2011, we restrict the sample to Syrian women who migrated to Jordan after 2011. After restriction, the sample includes 681 Syrian ever-married women.

For these women, we have information on physical violence committed by the current husband (for currently married women) or the most recent husband (for formerly married

women).[12] Physical IPV is measured by asking women if their husbands ever did any physically violent actions to them.[13] Moreover, for the women who have ever been exposed to physical spousal violence, we know when the first physical violence event occurred since the start of the marriage.[14] Among the women in our sample, 18% reported experiencing physical violence by their husbands at some point in their lives.[15] Appendix Figure A1 presents the distribution of the time interval between marriage and the incidence of the first physical IPV. The data suggest a higher likelihood of the first incident of violence occurring in the early years of marriage. Specifically, approximately 90% of the recorded IPV instances occur within the initial five years following marriage.

Using this data, we construct retrospective event histories for ever-being exposed to physical IPV. In particular, we put the data into a discrete-time duration analysis format, in which the waiting time concept is time after marriage, each period is one year, and exposure to violence constitutes the event of interest. The event history starts when the women get married.[16] The event history continues until the year of the first IPV exposure for ever-exposed women and until the survey year for never-exposed women. For ever-exposed women, the outcome variable takes the value of one at the year of first exposure and zero at all other years. For never-exposed women, the outcome variable is right-censored and takes the value of zero at all years. When the data are put into this woman-time structure, there are 7,607 observations for 681 women.

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[12] The World Health Organization states that IPV can include violence in non-married relationships. Since non-married relationships are very rare among Syrian refugees in Jordan, in this context, IPV refers to marital relationships where the husband is the abuser and the wife is the victim.

[13] The list of physical domestic violence events covered in the data are as follows: whether the husband pushes you, shakes you, or throws something at you; slaps you; twists your arm or pulls your hair; punches you with his fist or with something that could hurt you; kick you, drag you, or beat you up; try to choke you or burn you on purpose; or threaten or attack you with a knife, gun, or any other weapon.

[14] The original question is as follows: “How long after you first got married to your (last) husband did (this/any of these physical violence actions) first happen? (Write in the number of years)”

[15] Among those who ever experienced physical violence, 16% reported experiencing sexual violence, 21% reported being injured by their husband's actions, 7% reported their husband hurting them during a pregnancy, and 18% disclosed the occurrence of physical violence to someone else.

[16] In this sample, the youngest age of marriage is 12.

We aim to measure the impact of two critical junctures in refugee women's life cycle: (i) the onset of the Syrian civil war and (ii) arrival in Jordan and the beginning of life as a refugee. For this purpose, we generate a location indicator variable that takes three values: (i) prewar Syrian period (before the conflict began in 2011), (ii) postwar Syrian period (after the conflict began but before arrival in Jordan), and (iii) period in Jordan as a refugee. Online Appendix Table A2 illustrates the data structure.

Figure 1 illustrates the IPV hazard rates for three periods: prewar Syria, postwar Syria, and Jordan, based on all the woman-year observations in the sample. The data reveal several key findings. Firstly, across all three periods, the IPV hazard rate is highest during the initial years of marriage, gradually decreasing as the years progress. Secondly, examining the first five years in which 90% of the initial IPV events occur, both the postwar Syria and Jordan periods exhibit higher hazard rates compared to the prewar Syria period. Additionally, within the first year of marriage, during which 40% of the first IPV cases take place, the hazard rate in Jordan is about 0.09 in Jordan and 0.07 in postwar Syria but less than 0.06 in prewar Syria.[17]

5. Estimation

Using this data structure, we estimate a discrete-time hazard model with a piecewise constant baseline specification (Jenkins, 1995, 2005). The waiting time is years after marriage, each period is one year, and a failure occurs when the woman faces the first episode of physical IPV. Specifically, we estimate the following logistic hazard regression model

$$\text{logit}(h_{it}) = b(t) + \boldsymbol{X_i}\beta + v_i, \tag{1}$$

where t denotes the years since marriage. Here, h_{it} is the discrete-time hazard function for individual i, b(t) is the baseline hazard function, $\boldsymbol{X_i}$ denotes the set of control variables, and v_i stands for time-invariant unobserved heterogeneity (permanent unobserved characteristics) for individual i. The log-likelihood contribution of the ith person, $£_i$, is

[17] Krafft et al. (2021) report that 10% of adult Syrian refugee women in Jordan justify IPV by any means compared to 14% of adult Jordanian women.

$$\log £_i = \sum_{t=1}^{T_i}[d_{it}\log(h_{it}) + (1-d_{it})(1-\log(h_{it})], \quad (2)$$

where d_{it} is the dependent variable, which takes the value of one if woman *i* faces physical IPV in period *t* and zero otherwise. Here, d_{it} can be equal to one only in the last period in the sample, $t{=}T_i$. Specifically, we use the following specification for the hazard function in equation (1),

$$\text{logit}\big(h_i(\text{t})\big) = \tau_0 + \sum_{j=1}^{k}\tau_j D_j + \beta_1\,(postwarSyria)_{it} + \beta_2\,(inJordan)_{it} + \boldsymbol{Z_{it}\Gamma} + v_i + e_{it}. \quad (3)$$

The baseline hazard function controls for years after marriage in the form of a dummy variable for k groups (intervals) of years after marriage , D_j.[18] In other words, we use a piece-wise constant baseline specification in years after marriage (although we check the robustness of our findings to the use of alternative baseline specifications). The key variables of interest are *postwarSyria* and *inJordan*. The $(postwarSyria)_{it}$ variable takes the value of one for woman i after 2011, but before her arrival in Jordan and zero otherwise, and $(inJordan)_{it}$ takes the value one for woman i after her arrival in Jordan and zero otherwise. The key parameters of interest are β_1 and β_2, showing the difference between the exposure probabilities in postwar Syria and prewar Syria and the difference between the exposure probabilities in Jordan and prewar Syria, respectively. In equation (3), $\boldsymbol{Z_{it}}$ stands for the remaining set of control variables: dummies for marriage age categories,[19] type of place of residence (urban, rural), and region of place of residence (north, central, and south).[20]

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[18] We take 9 intervals because this is the maximum number of intervals that allows the estimation of other variables. In other words, variation exists in the other variables for each interval. We take 9 equal intervals in terms of the number of observations, and the resulting intervals are 0–1, 2, 3–4, 5–6, 7–8, 9–10, 11–13, 14–17, 18–36.

[19] Because a woman enters the risk set when she gets married, the age of marriage becomes a state variable. We take quartiles, where the first quartile covers ages 12 to 16, the second quartile ages 17 and 18, the third quartile ages 19 to 21, and the fourth quartile includes ages 22 and above.

[20] We do not include direct controls for women's employment status, household wealth, and husband characteristics because these characteristics are jointly determined by women's marriage and resulting IPV and, therefore, would be endogenous. Essentially, we do not control for outcomes that are realized with and after marriage.

Permanent unobserved characteristics of individuals regarding their potential IPV propensity that might be correlated with our key variables of interest could cause omitted variable bias. Therefore, equation (3) allows for unobserved heterogeneity, where v_i stands for time-invariant unobserved individual characteristics. We assume a normal distribution for v_i with zero mean and finite variance. Here, the distribution of v_i is assumed to be independent from the control variables. In equation (3), e_{it} stands for time-variant unobserved individual characteristics.

Accounting for permanent observed characteristics regarding IPV propensity is important to separate state dependence in IPV from this unobserved heterogeneity. Specifically, as couples with high IPV propensity leave the sample early due to their high hazard rates in the initial periods after marriage, the sample would include more and more low-IPV-propensity couples over time. This would result in a higher level of negative duration dependence in the baseline hazard than the actual level—when we do not account for unobserved heterogeneity. In addition, Lancaster (1990) demonstrates that unobserved heterogeneity attenuates the effect of the hazard in response to changes in each regressor at any point in time. In simpler terms, a positive coefficient in a model without unobserved heterogeneity will underestimate the true estimates.

We also extend equation (3) in two different ways. First, the impacts of civil war and refugee status on IPV could vary by the waiting time concept (years after marriage). To allow for this, we add interactions of the civil war and the refugee status dummies with the logarithm of years after marriage to equation (3). Second, the impact of refugee status might depend on the duration of residence in Jordan, as refugees acclimatize to their new surroundings. Hence, in a second extension of equation (3), we interact the refugee status dummy with years in Jordan.

Our identification of the effects of the civil war and refugee status is based on a sample of people who decided to immigrate to Jordan. Hence, our estimates are for the Syrian refugee population in Jordan but not the total Syrian population.[21] In this framework, we compare individuals in pre-war Syria, post-war Syria, or Jordan. Here, the key identification assumption is that the timing of the war and arrival in Jordan is unrelated to IPV outcomes. There is no reason

[21] If the Syrian refugees in Jordan are different from the total population in Syria in terms of their IPV propensity (because their arrival in Jordan is associated with socioeconomic factors that also relate to IPV), our estimates would not hold true for the total Syrian population. Nonetheless, the relevant population for the question in this study is the group of refugees anyway.

to expect the timing of the war to be related to IPV. The remaining issue is whether or not the timing of arrival in Jordan could be related to IPV. Suppose that families with a higher IPV propensity also have a higher likelihood of earlier immigration to Jordan. (Although IPV is not likely to be one of the prime factors in determining the emigration decision in the context of a civil war, it might be correlated with such factors as employment.) In this case, we would observe a higher IPV risk in Jordan than in Syria. However, since we account for unobserved heterogeneity (albeit parametrically), we account for such time-invariant unobserved characteristics.

The women in our sample enter the risk set when they get married—which is important in different ways. First, the key variables of interest—*postwar Syria* and *in Jordan*—could affect the marriage age. In this case, the civil war and refugee status would potentially affect IPV outcomes via a different channel—the changing composition of our married women sample. Hence, in a separate analysis, we restrict our sample to women already married before the onset of war—thereby eliminating any compositional effects—and estimate equation (1) using this sample. Second, the marriage age is potentially significant because it could also affect the baseline hazard rate. In other words, how the IPV risk evolves over years after marriage might change by marriage age. Hence, in an alternative specification, we also interact the baseline control for time after marriage with marriage age groups. In this case, we take a more parsimonious specification for years after marriage; instead of the 9 interval dummies in equation (1), we take a cubic polynomial of years after marriage. Specifically, we interact this cubic polynomial with the four marriage-age groups.

6. Results

6.1 Main Results

Table 1 shows the results of estimating equation (1) using alternative specifications that differ by the baseline hazard specification and the use of unobserved heterogeneity. Specifically, Table 1 presents the estimates for the two key variables of interest: "in Jordan" and "postwar Syria" dummies, where the omitted category is prewar Syria. The first column uses a piecewise constant baseline hazard and no unobserved heterogeneity. As shown in column (1), the IPV hazard rate in Syria increases by 0.8 pp with the war, and the IPV hazard rate as a refugee in Jordan is 0.6 pp higher than in prewar Syria. While the estimated coefficients are statistically significant at the 10%

level, the marginal effects are marginally statistically insignificant at the same level. Column (2) adds unobserved heterogeneity. Here, both the magnitudes and the statistical significance of the estimated impact are much larger. The IPV hazard rate is 2.5 pp higher in postwar Syria and 2.4 pp higher in refugee status than in prewar Syria. These are both statistically significant at the 5% level.

We use different baseline specifications in columns (3) to (6). Specifically, the baseline hazard is a cubic polynomial in years since marriage in column (3), and the interaction of this cubic polynomial with marriage age groups in column (5). The estimates for the impacts of civil war and refugee status are similar to those in column (1). Columns (4) and (6) add unobserved heterogeneity on the top of the specifications in columns (3) and (5), respectively. Here, the estimated impacts are also much larger but not as large as the difference in the estimates between columns (1) and (2). In other words, adding unobserved heterogeneity makes a smaller impact when the baseline hazards are variants of a cubic polynomial in years since marriage. As discussed earlier, we primarily use the specifications in columns (3) to (6) to allow the baseline hazard to vary by marriage age. However, a comparison of columns (3) and (5) and columns (4) and (6) indicates that this makes little difference in the estimates. Hence, in the rest of the paper, we focus on the specifications in columns (1) and (2).

Consistent with the argument of Lancaster (1990), our findings in Table 1 indicate that models without unobserved heterogeneity produce lower estimates. Jenkins (2005) reports that the model without unobserved heterogeneity will overestimate the degree of negative duration dependence in the true baseline hazard. To examine this, we compare the estimated baseline hazard functions from specifications (1) and (2) (Appendix Figure A2). In fact, the baseline hazard function from specification (1), without unobserved heterogeneity, demonstrates much higher negative duration dependence.

6.2 Robustness Checks

Our sample includes women who got married in pre-war Syria, as well as those who married in post-war Syria and after migrating to Jordan. One plausible explanation for the observed increase in IPV rates during the civil war and under refugee status might be that marriages formed after the war or migration to Jordan may differ from previous unions—resulting in a change in the sample composition. For instance, women who marry as refugees in Jordan might enter into

marriages with higher inherent risks of violence, which can be attributed to factors such as the age at which they get married, the type of marriage, the characteristics of their husbands, or unobserved traits. In order to eliminate these potential compositional effects, we restrict the sample to women who were already married before the onset of the war in Syria.

Panel (A) of Table 2 shows that our results persist when the compositional effects are eliminated. The statistical evidence regarding the impact of civil war remains, and the magnitude of the estimated impact is somewhat larger. Regarding the effect of the refugee status, the statistical significance is lower due to higher standard errors resulting from the smaller sample. However, the magnitude of the coefficient estimates is even larger in models without unobserved heterogeneity but similar in models with it. These findings indicate that the estimated effects of the civil war and refugee status on IPV, shown in Table 1, do not merely result from a change in the composition of the married sample—but these events increase the IPV rates for a given group of married women. At the same time, these events could still impact the IPV rates via a change in the marriage patterns after the civil war—which we examine later in the text when we delve into understanding the mechanisms of the observed effect of the two events on IPV.

Another factor potentially contributing to a significant increase in IPV hazard rates among younger women is the presence of recall bias. This bias arises due to a noticeably lower proportion of middle-aged women reporting instances of abuse that occurred during their younger years compared to the proportion reported by younger women (Yoshihama & Gillespie, 2002). Recall bias presents a common challenge in IPV studies, as individuals are required to remember and report past incidents of violence. We assess the sensitivity of our findings to such recall bias by making sample restrictions that would reduce the recall bias.

First, we narrow the sample to include only younger women, focusing on those under 30 in the survey year. Columns (3) and (4) of Table 2 demonstrate that the estimation using the younger sample yields larger coefficients for both refugee status and civil war than those in columns (1) and (2) of Table 1. While the coefficients for refugee status maintain their statistical significance, the coefficients for civil war lose their statistical significance in this smaller sample despite their larger magnitude. Older women, excluded from the sample, experienced the ages at which the marriage hazard rate was high before the war. Considering the higher probability of initial IPV exposures occurring in the early years of marriage, we find a greater impact on IPV

hazard rates for the group who experienced war and forced migration during the ages characterized by a high marriage hazard rate.

We conduct additional analyses by restricting the sample to women who have been married for 15 or fewer years in columns (5) and (6) of Table 2 and to women who have been married for 10 or fewer years in columns (7) and (8). These samples allow us to examine the estimation results for more recent experiences, thereby minimizing the potential impact of recall bias. The estimates in columns (5) to (8) indicate that focusing on more recent events yields larger coefficient estimates for both refugee status and civil war. The precision of the estimates in columns (5) to (8) is similar to those in columns (1) and (2) of Table 1, and the models with unobserved heterogeneity yield higher precision.

6.3 Extensions

As explained earlier in the Estimation Section, we extend equation (3) by adding (i) the interactions of "in Jordan" and "postwar Syria" dummies with the years after marriage and (ii) the interaction the "in Jordan" dummy with the years of residence in Jordan.

Columns (1) and (2) in Table 3 illustrate the results of estimating the first extension. Both columns indicate that IPV increases in refugee status, but this impact decreases as the number of years after marriage increases. Regarding the impact of civil war, the specification in column (2), allowing for unobserved heterogeneity, provides evidence that IPV rises after the civil war. The coefficient of the interaction of civil war with years after marriage is negative and large but statistically insignificant at conventional levels. Panel (A) of Figure 2 displays how the difference between the IPV risk in Jordan and prewar Syria differs by years after marriage according to specification (2). The figure indicates statistical evidence of a difference during the first six years after marriage. The percentage-point rise in IPV decreases in years after marriage. When we compare these percentage-point changes to the mean IPV levels by years after marriage, we find that the increase is 90% in the first year (for which the mean level is the highest) and higher than 100% each year from the second to the sixth. In other words, the percentage changes remain highly elevated within all first six years after marriage.

Panel (B) of Figure 2 displays the variation in the difference between the IPV risks in postwar Syria and prewar Syria by years after marriage. There is statistical evidence of a difference for the first four years. The percentage-point effects illustrated in the figure decrease by years after

marriage. When we estimate the percentage changes using the mean IPV levels by years after marriage, we calculate a 71% rise in the first year after marriage and higher than 100% each year from the second to the fourth.

Figure 2 displays significant increase in IPV hazard rates due to civil war and refugee status during the initial years of marriage. If these impacts are merely tempo effects, in which IPV occurs earlier rather than later, they would not necessarily translate into a change in the fraction of women ever exposed to IPV in their marriage lives. Hence, we also calculate the survival rates (the fraction of women never exposed to IPV) after 30 years of marriage using a specification that interacts the key variables of interest with years after marriage. We interact the key variables of interest with years since marriage in columns (1) and (2) of Table 3 because we are interested in the interaction coefficient there. Here, we take a more flexible specification in which we interact the key variables of interest with dummies for several intervals of years since marriage. Using the estimated coefficients of this specification, we calculate the survival rate after 30 years as 0.826 in prewar Syria but 0.728 in postwar Syria and 0.757 in refugee status. Therefore, we can conclude that civil war and refugee status not only changes the tempo of IPV but also the fraction of women ever exposed to IPV.

In Table 3, the estimates in columns (3) and (4) show that while refugee status increases the IPV risk, this impact diminishes over the duration of residence in Jordan. The evidence of the impact of the civil war persists. Panel (C) of Figure 2 displays how the impact of refugee status varies by duration of residence in Jordan using the coefficient estimates for "in Jordan" and its interaction with duration of residence. The figure indicates statistical evidence for IPV increasing in refugee status during the first three years in Jordan but not afterwards. Quantitatively, the IPV hazard rate increases by more than 300% during the first year in Jordan, 130% during the second year, and 67% during the third year.

7. Understanding the Rise in IPV Hazard Rates

7.1. The Effect of Worsening Economic Conditions

To investigate whether deteriorating economic conditions could be a driving force behind the rise in IPV hazard rates, we compare both the employment outcomes of Syrian refugees and asset holdings of Syrian households in Jordan with those in prewar Syria. Here, the prewar Syria

data on employment outcomes come from 2009-SFHS, and the prewar Syria data for asset holdings come from the 2009-SFHS and 2006-SMICS. Since Syrian refugees in Jordan are more likely to originate from the southern part of the country and regional differences are important in Syria, we weight the governorate-specific averages by the fraction of Syrian refugees originating from each governorate based on related UNHCR data (UNHCR, 2017).

Table 4 compares Jordan and prewar Syria in employment outcomes and asset holdings. Panel A shows that men's employment rate is much lower in Jordan than in prewar Syria (70.5% in Jordan vs. 93.2% in Syria for married men). Among women, employment rates are lower in Jordan than in prewar Syria (3.0% in Jordan vs. 16.3% in Syria for married women). These patterns suggest that refugees' household labor income is significantly lower in Jordan than in prewar Syria.

Panel B of Table 4 shows that ownership of specific assets is much lower for Syrians in Jordan than in prewar Syria. Only 8% of the refugee households in Jordan own a house compared to 93% before the war. In addition, among Syrian refugee households in Jordan, 8% own a car, whereas 17% of households in Syria own a car. Furthermore, the ownership rate of housing items, such as washing machines, air conditioners, and computers, is lower in Jordan than in prewar Syria.[22]

To better understand Syrian refugees' wealth status, we generate a wealth index and compare the Jordanian native and Syrian refugee populations regarding this index. The JPFHS dataset includes a wealth score variable, where households are given scores based on the number and kinds of consumer goods they own.[23] We use these wealth scores to rank households. Online Appendix Figure A3 highlights a stark contrast between natives and Syrian refugees regarding wealth distribution. The graph reveals that approximately 73.2% of Syrian households are clustered in the lowest decile and 92% in the lowest three deciles. In contrast, only 10.1% of Jordanian households are in the lowest decile and about 35% in the lowest three deciles. Furthermore, the figure indicates that less than 2% of Syrian households are in deciles seven and

[22] Similarly, Ibanez and Moya (2010) report that displaced people in Colombia experienced asset losses, sharp drops in income, and a deterioration in labor conditions.

[23] The household assets considered for the wealth index range from a television to a bicycle or car, and housing characteristics such as source of drinking water, toilet facilities, and flooring materials. These scores are derived using principal component analysis.

above. In essence, the figure shows significantly lower levels of wealth for Syrian households compared to their Jordanian counterparts.

The evidence provided in this section suggests that the observed rise in IPV hazard rates can be attributed to an increase in poverty among refugee families, as evidenced by declining employment rates of family members and a decrease in family assets. If the hypothesis suggesting that IPV rates rise due to increasing poverty holds in this case, we anticipate observing a more pronounced rise in IPV within subgroups that experience higher levels of impoverishment. To test this hypothesis, we divide the married male sample into two groups based on their educational attainment and compare their employment rates. Panel (A) of Table 5 compares employment rates, with the first group comprising married men with less than a secondary school education and the second group comprising those with at least a secondary school education. This comparison shows that employment rates are much lower in Jordan compared to Syria for low-educated and high-educated men in all age groups. However, less-educated Syrian men across all age groups experience more substantial employment losses in Jordan. This disparity is particularly striking among the 20-24 age group, where men face high marriage hazard rates. In this age group, the employment rate of low-educated men is 0.91 in Syria but 0.56 in Jordan (38% drop), while the employment rate of high-educated men is 0.87 in Syria and 0.79 in Jordan (9% drop). This pattern persists across all age groups, with consistently wider gaps in employment rates observed among low-educated men. Essentially, refugee husbands with lower educational attainment suffer a more significant loss of employment compared to husbands with higher educational attainment.

Suppose the rise in IPV hazard rates results from worsening economic conditions. In that case, IPV rates will increase more among wives of men with lower educational attainment, who experience a more significant loss of employment. To investigate this hypothesis, we divide the women's sample based on their husband's education level and examine the effect on IPV hazard rates. The estimation results in panel (B) of Table 5 show statistically significant evidence that the civil war and refugee status increase IPV for wives of less-educated husbands. In contrast, no such evidence exists for wives of more educated husbands. In addition, the magnitudes of the estimated coefficients are much larger for women with less-educated husbands. In essence, the rise in IPV hazard rates is more pronounced for the group of wives whose husbands experience more significant employment losses, namely, low-educated husbands. These findings support the idea that employment loss and resulting economic difficulties contribute to the rise in IPV.

Another possible explanation for the increased IPV rates among the wives of less-educated husbands is that women who migrated to Jordan and married there may have married men with lower educational attainment (and therefore lower employment prospects). To test this hypothesis, we conduct an analysis reducing the sample to include only women who got married before the start of the war (pre-2011). Once again, the estimation results in Online Appendix Table A3 indicate a significant effect among wives of low-educated men, while we find no effect among wives of high-educated men. This finding points to the significance of the economic strain resulting from husbands' employment loss on the IPV rates among women who were already married prior to the war. Hence, the results in Table 5 do not merely stem from changes in marriage patterns resulting from migration.

7.2. The Effect of Social Isolation

Another reason that forced migration could contribute to a heightened risk of IPV is the social isolation experienced by displaced women. The presence of a strong network, especially from close relatives and companions, is vital in guarding against IPV. Women who have access to a sturdy network typically have more protection from violence by partners. To examine if social isolation contributes to IPV among Syrian refugees, we analyze the GPS locations of refugee households from the 2017-18 JPFHS using GIS software. We calculate the density of Syrian households within varying radii around each surveyed household to gauge the level of social support available.

Here, the critical identification assumption is that the settlement patterns of refugees are not related to their likelihood of experiencing IPV, conditional on the covariates and couple-level fixed characteristics (in models with unobserved heterogeneity). The settlement patterns of refugees are more likely to be influenced by factors such as the initial location of camps, the distance to the origin areas, and employment opportunities. As long as this assumption holds, our research design mimics an experiment where refugee women are distributed across various regions of a new country without established social networks. We use fellow refugees' geographic proximity and density as a proxy for their available social support.

The findings in Table 6 show statistical evidence that the IPV hazard rate decreases as the refugee densities in a 2km radius and in a 5km radius increase. Quantitatively, when the refugee-to-native ratio in a 5km radius increases from 0 to 0.1, the IPV hazard rate falls by 0.38 pp (24%).

This result indicates that Syrian women in less dense refugee areas in Jordan are at a greater risk of IPV, highlighting the importance of social support networks in these communities.

7.3. The Effect of Changing Marriage Patterns

Civil war and refugee status could also impact the IPV rates via their impacts on marriage patterns, although our analysis in Table 2 shows that this cannot be the sole mechanism explaining the observed effects of the two events on IPV. Here, we investigate any potential changes in marriage outcomes resulting from the civil war in Syria and forced migration. Using JPFHS, this time, we construct retrospective event histories for marriage. In particular, we put the data into a discrete-time duration analysis format, in which the waiting time concept is age, each period is one age, and marriage constitutes the event of interest. The event history starts at age 12, the youngest marriage in the sample, for all women. The event history continues until the age of the first marriage for ever-married women and until the age of the survey year for never-married women. For ever-married women, the outcome variable takes the value of one at the age of marriage and zero at all other ages. For never-married women, the outcome variable is right-censored and takes the value of zero at all age values.

For this data structure, there is an important issue in generating one of the key variables of interest: the "in Jordan" dummy variable. Unlike the duration analysis for IPV, which includes only ever-married women, the duration analysis for marriage includes both ever-married and never-married women. However, the "arrival year" information is available only for ever-married women in the JPHFS.[24] If a never-married woman lives in the same household with an ever-married woman, we assign the "arrival year" of the ever-married woman also to the never-married woman. This procedure works for 73% of the never-married women. For the remaining 27% of the never-married woman, however, we still do not know the arrival year. To address this issue, we take two different approaches. In the first one, we use inverse probability weighting, as in Chesnaye et al. (2022). Using the sample of never-married women, we conduct a logistic regression to estimate the probability of living in the same household with an ever-married woman, based on covariates such as age, education, wealth, and region. We then calculate weights as the

[24] The information on "arrival year" comes from the Women Dataset (IR), which includes only ever-married women. The Person Dataset (PR) contains information about never-married women.

inverse of these predicted probabilities to adjust for the fact that our sample is more likely to include never-married women who live in the same household with ever-married women than never-married women who do not have other ever-married women in the same household. In the second approach, we assign the mean value of the year of arrival in the data—2013—to the remaining never-married women with missing information (27% of the never-married women). Here, it is important to note that little variation exists for the year of arrival variable in our sample.[25] The second approach uses the full sample of women in our data (1,897 women)—which we call sample 2—whereas the first approach excludes the never-married women with no ever-married women in the same household (1,786 women)—which we call sample 1.

Online Appendix Figure A4 displays the marriage hazard rates for the three periods of interest based on sample 2. The marriage hazard rates in Jordan are higher than the rates in prewar Syria and postwar Syria. Next, using marriage hazard rates as the dependent variable, we estimate the effects of the civil war and refugee status. The estimation results in Table 7 show evidence for each sample that both war and refugee status increase marriage hazard rates. Compared to prewar Syria levels, the marriage hazard rate is 6.1 pp higher (62% increase from the mean level of 0.099) in postwar Syria and 8.3 pp higher in Jordan (84% increase) according to the estimates with sample (1). The estimates with sample (2) are quite similar. A comparison of column (1) with (2) and column (3) with (4) indicates that allowing for unobserved heterogeneity makes little difference in the estimates. The significant rise in marriage hazard rates due to civil war and refugee status prompts us to inquire about the specific types of marriages that have experienced an increase and whether these are the marriages associated with higher IPV risk.

Previous studies find a strong association between child and early marriage and increased IPV rates (Ahinkorah et al., 2022; Coll et al., 2023; Hayes & Protas, 2022; Kidman, 2017). Marrying at a young age often entails limited agency and decision-making power, leaving women with little choice but to enter into potentially violent partnerships. Furthermore, these women may find themselves trapped in these marriages with limited options for seeking alternatives or leaving the abusive relationship. To examine whether a possible decrease in marriage age resulting from migration contributes to increased IPV, we investigate how the effects on marriage hazard rates vary across different age groups. First, we estimate a model in which the effects of war and refugee

[25] In fact, 73% of the women in our sample arrived in Jordan between 2012 and 2014.

status vary by age. Appendix Figure A5 displays the estimated age-specific effects of the two events. Using these effects, we estimate the predicted hazard (and survival) rates at each age and calculate the mean age at marriage in three cases: i) in prewar Syria, ii) in postwar Syria, and iii) in Jordan. These calculations show that the mean age at marriage decreases from 20.0 in prewar Syria to 18.4 in postwar Syria and 17.7 in Jordan. Therefore, the fall in the average marriage age might contribute to the elevated IPV rates, as suggested in the literature.

Several studies suggest a lower likelihood of IPV in cousin marriages.[26] This can be attributed to the presence of stronger familial and community support systems, including mediation and conflict resolution mechanisms, which contribute to a reduced incidence of IPV.[27] If women in first-cousin marriages are protected against IPV, a potential change in the ratio of such marriages may impact the IPV hazard rates. Hence, we examine how the rates of cousin and non-cousin marriages are affected by war and refugee status. Table 8 provides the estimation results for different types of marriage based on the specification with unobserved heterogeneity. (As in Table 7, not accounting for unobserved heterogeneity makes little difference here.) The results in columns (1) and (2) indicate that both cousin and non-cousin marriage hazard rates are higher in Jordan than in prewar Syria. However, the rise in the non-cousin marriage hazard rate in Jordan (7.6 pp) is higher than in the cousin marriage hazard rate (0.9 pp). Considering that the baseline level of cousin marriages is half that of non-cousin marriages (0.033 vs. 0.066), the rise in non-cousin marriages is higher in both percentage-point and percentage terms. Consequently, the relatively higher increase in non-cousin marriages, associated with a relatively higher risk of violence, could potentially contribute to the rise observed in IPV hazard rates.

Another factor associated with an increased risk of IPV is polygamy.[28] Therefore, a potential increase in polygamous marriages resulting from civil conflict or forced migration may

[26] Campbell and Mace (2022) analyze over 16000 Jordanian women from three cohorts of the Jordan Demographic Health Surveys and find that being married to a patrilateral cousin is associated with a reduced risk of reporting IPV. In addition, Weimer (2019) finds that marriage to a first cousin is significantly and negatively correlated with domestic violence in Pakistan, Egypt, and Jordan.

[27] Hamamy and Alwan (2016) indicate that consanguineous marriages are preferred in countries with civil unrest because close-kin marriage is regarded as safeguarding for personal and family.

[28] Several studies, such as those conducted in Brazil (Kiss et al., 2012), Kenya (Lawoko et al., 2007), Ethiopia (Sharma et al., 2020), and Nigeria (Onuh et al., 2018) report that being in a polygamous relationship is a significant

contribute to a rise in IPV rates. To test this hypothesis, we further investigate changes in the prevalence of polygamous marriages. However, the estimation results in Table 8 indicate no statistically significant effects of war and refugee status on the occurrence of polygamous marriages. Nevertheless, a noteworthy increase exists in non-polygamous marriages. Therefore, in this case, polygamy cannot be identified as a factor that explains the observed increase in IPV.

Several studies suggest that the age and education gap between spouses is associated with a higher risk of IPV.[29] It is presumed that in cases where there is a notable discrepancy in age and education between spouses, the husband, who typically possesses greater life experience and social status, may exert more control and dominance over his wife. This power imbalance often leads to a lower bargaining power for the woman, consequently contributing to the perpetration of IPV.[30] Here, the next question arises as to whether the higher rates of IPV can be attributed to a greater power imbalance in terms of age and educational disparities in marriages occurring in Jordan compared to those formed in pre-war Syria.

To investigate this, we first examine how war and refugee status affect the prevalence of marriages with a significant age gap (where the husband is 5 or more years older than the woman) compared to marriages with a smaller age gap (where the age difference is less than 5, or the woman is older). The estimation results in Table 8 indicate a statistically significant increase in both large age-gap marriages (3.1 pp) and small age-gap marriages (7.1 pp) in Jordan. However,

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determinant of women's exposure to IPV. In addition, Heath et al. (2020) conduct a randomized control trial examining the effects of Mali's national cash transfer program in a West African context where approximately 40% of households practice polygamy. They find that the program resulted in significant reductions in IPV within polygamous households, whereas its effects were more limited in monogamous households. They suggest that the program led to notable decreases in stress and anxiety among men in polygamous households, as well as larger reductions in disputes compared to monogamous households, supporting the notion that polygamy might increase the IPV risk.

[29] For instance, studies conducted in India (Chaurasia et al., 2021), Columbia (Jones & Ferguson, 2009), and Nigeria (Oyediran & Feyisetan, 2017) provide evidence of a positive association between the age difference between couples and the risk of IPV. Furthermore, Cunradi et al. (2002) suggest that among black couples in the United States, age difference contributes to the likelihood of violence. Additionally, Bonnes (2016) finds that educational differences between a woman and her partner have an impact on her likelihood of experiencing IPV in Malawi.

[30] The age gap between partners can serve as a proxy for differences in life experience at the time of marriage and is associated with variations in bargaining power (Casterline et al., 1986).

when considering these increases relative to the baseline levels, marriages with a large age gap increase by 55%, while marriages with a small age gap increase by 165%.[31]

Second, we investigate the shift in the prevalence of marriages where the husband has a higher education level compared to marriages where the husband has an equal or lower education level than his wife. The estimation results in Table 8 indicate a significant increase in both groups. However, marriages where the husband is more educated rise by 1.2 pp (52%), while the others rise by 6.8 pp (91%) in Jordan. Thus, marriages where the husband is not more educated than the woman rise more in both percentage points and percent terms. These two analyses, which examine marriages based on potential changes in age and educational disparities, indicate no evidence of a greater power imbalance between spouses in marriages occurring in Jordan than those formed in prewar Syria. Therefore, this particular factor does not explain the increase in IPV rates in this context.

8. Conclusion

In this paper, using nationally representative microdata of Syrian refugees in Jordan, we examine how two critical junctions in refugees' life-cycle—the onset of the civil war and the arrival in Jordan—impact women's risk of IPV. Our estimation results suggest that war and refugee status increase the IPV hazard rate compared to prewar Syria. The impact of refugee status on IPV is particularly acute in the first few years in Jordan.

A contributing factor to the increased IPV rates is the deteriorating economic conditions experienced by refugee households, which is evident through declining asset holdings and employment rates. Furthermore, our analysis reveals that husbands with lower educational attainment, who suffer more substantial employment losses, are more likely to perpetrate IPV. This finding underscores the importance of economic distress in exacerbating IPV risk within displaced communities.

Additionally, our study highlights the impact of social isolation on IPV risk among Syrian refugee women. The analysis, leveraging location data to gauge social support through refugee

[31] We also conduct the same analysis using a 3-year and 10-year age gap instead of a 5-year, and the estimation results, given in Online Appendix Table A4, confirm the robustness of our findings.

household density, reveals a significant negative effect of social support on IPV risk. This emphasizes the critical role of social networks in mitigating IPV among refugees, demonstrating that reduced social support in the resettlement context can contribute to increased violence.

Although civil war and forced migration have led to an increase in marriage rates and patterns, this alone cannot explain the rise in IPV. When we restrict the sample to women who were already married at the onset of the civil war, we still find that IPV is higher in postwar Syria and in refugee status than in prewar Syria. At the same time, we uncover evidence suggesting that changes in marriage patterns due to civil war and forced migration still contribute to the rise in IPV. Specifically, the average age of marriage decreases and the likelihood of non-cousin marriages rises, both of which are associated with a higher risk of IPV. On the other hand, we find that other changes in marriage characteristics, such as the likelihood of polygamous marriages and age and education gaps between spouses, cannot explain the rise in IPV.

While our study provides valuable insights into the relationship between civil conflict, forced migration, and IPV, there might be other channels at play that we could not examine due to data limitations, such as mental health problems resulting from exposure to civil war and forced migration. In addition, refugees' legal status might influence refugee women's reporting of IPV cases, as reported by Ibanez et al. (2022) in the context of Venezuelan refugees in Colombia. Nonetheless, the findings presented here are robust and provide crucial evidence for understanding the dynamics of IPV among refugee women.

This study's findings present alarming implications for the well-being of refugee women, encompassing their physical, mental, sexual, reproductive health, and economic stability. An established and robust body of evidence connects IPV with these adverse outcomes. Our exploration into the underlying mechanisms has also shed light on viable policy instruments that could be mobilized to counter the observed escalation in IPV. Enhancing the economic stability of refugee populations through increased access to employment or direct financial support initiatives, like cash transfers, could be a crucial step forward. Equally important is the need to counteract the social isolation frequently experienced by refugee women. Another vital policy objective is designing interventions that bolster their social networks and actively involve refugee communities in creating their own monitoring and prevention strategies. Finally, the particularly elevated risks of IPV in the first years of arrival in Jordan underscores the need for early intervention and support for refugee women.

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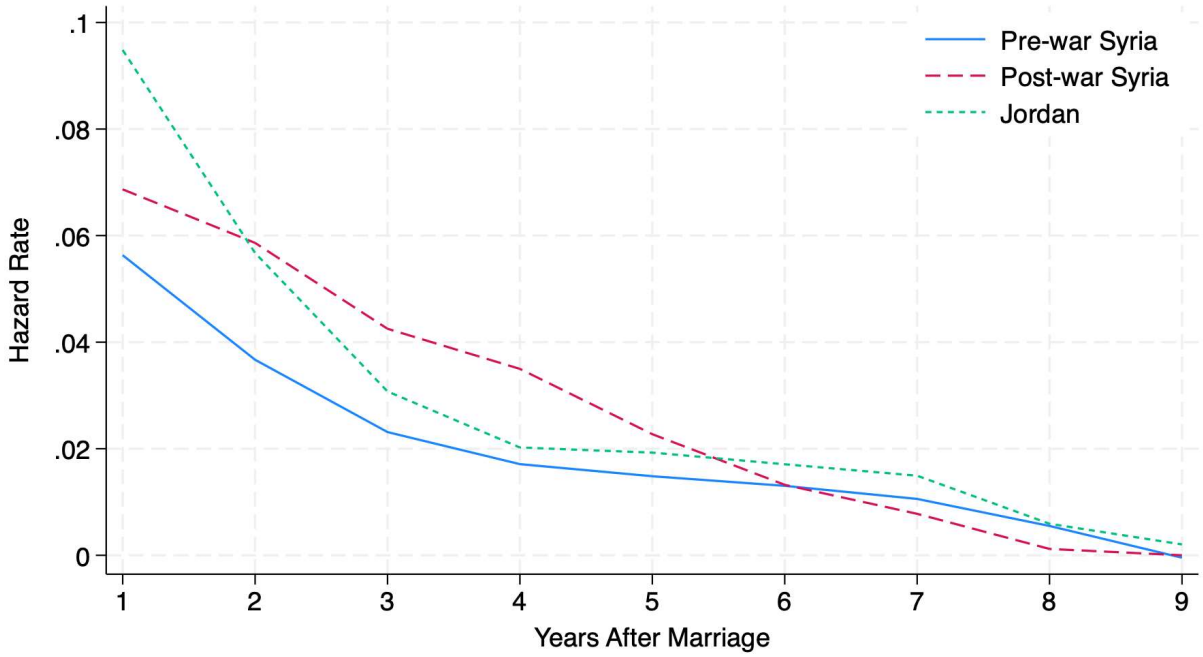
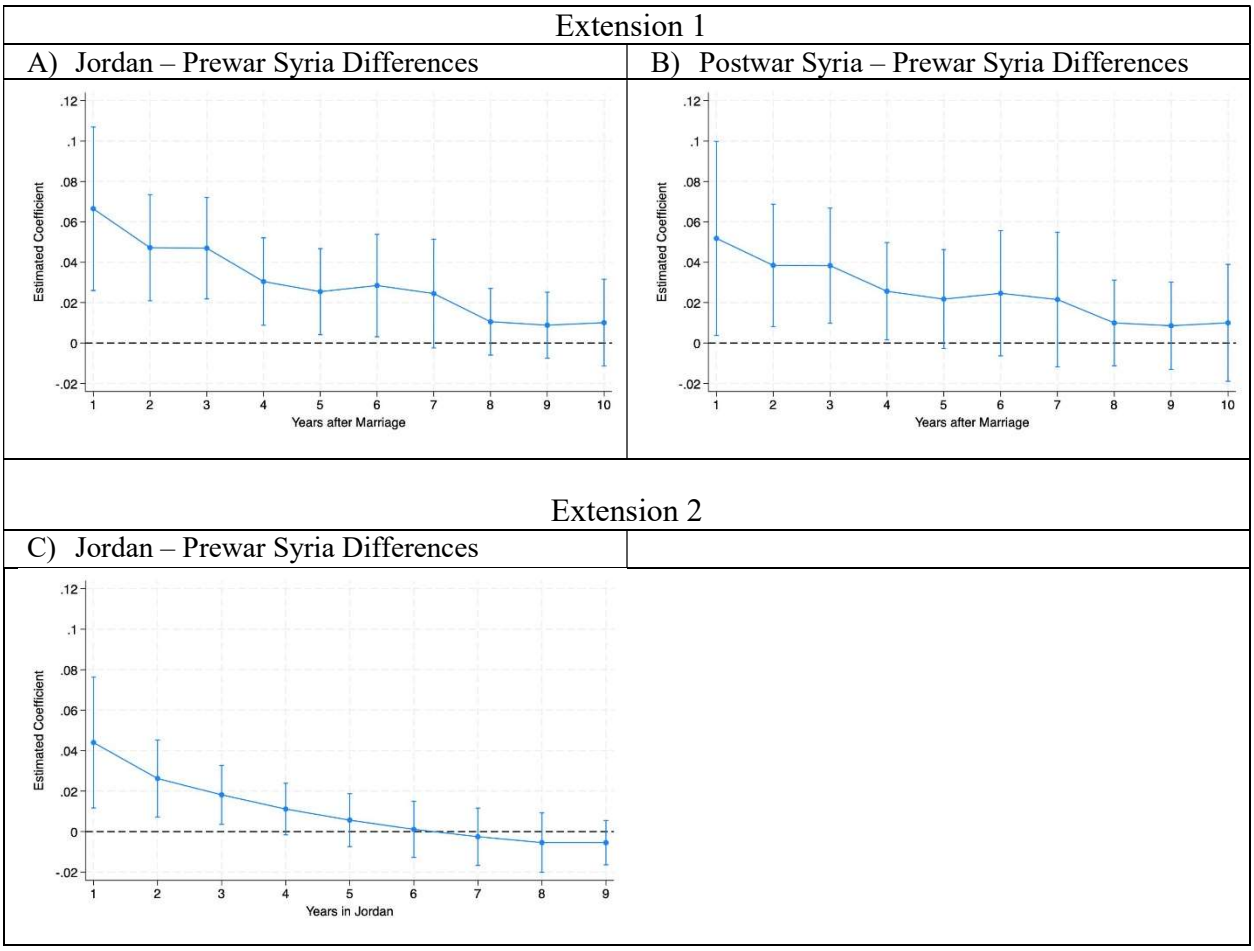
Tables and Figures

Figure 1: Hazard Rates of Physical IPV Exposure by Years after Marriage



Notes: This figure illustrates the IPV exposure hazard rates for three periods: pre-war Syria, post-war Syria, and Jordan. The data come from the 2017-18 Jordan Population Family and Health Survey, Women Module (IR) - Domestic Violence Sample. The sample includes all 15- to 49-year-old ever-married Syrian women. The sample is put into a discrete-time duration analysis structure, in which each period is one year, and failure is exposure to the first physical IPV event. The event history starts at the marriage year for all women and continues until the year of the first IPV exposure for ever-exposed women and until the survey year, 2017-18, for never-exposed women. For ever-exposed women, the outcome variable takes the value of one at the year of first exposure and zero at all other years. For never-exposed women, the outcome variable is right-censored and takes the value of zero at all years. The hazard rates for each year after marriage are smoothed using lowess smoothing.

Figure 2: The Effects of Civil War and Forced Displacement on Physical IPV Hazard Rates by Years after Marriage and Duration of Residence in Jordan



Notes: The estimates come from Table 3. The first panel presents the coefficients of the interactions of the "in Jordan" dummy variable with years lived in Jordan. The second panel presents the coefficients of the interactions of the "in Jordan" dummy variable with years after marriage. The third panel presents the coefficients of the interactions of the "postwar Syria" dummy variable with years after marriage. All panels include dummies for marriage age intervals as control variables, and control for unobserved heterogeneity assuming a normal distribution with zero mean and finite variance for the unobserved individual-specific term. The 90% confidence intervals are provided.

Table 1: The Effects of Armed Conflict and Forced Displacement on Physical IPV Hazard Rates

	(1)	(2)	(3)	(4)	(5)	(6)
In Jordan	0.378*	0.905**	0.405*	0.670*	0.393*	0.683**
	(0.223)	(0,368)	(0.221)	(0,344)	(0.221)	(0.320)
Postwar Syria	0.465*	0.882**	0.458	0.698*	0.444	0.707*
	(0.282)	(0,409)	(0.281)	(0,375)	(0.282)	(0.361)
Marginal Effects - in Jordan	0.006	0.024**	0.007*	0.015	0.007	0.015*
	(0.004)	(0.010)	(0.004)	(0.009)	(0.004)	(0.008)
Marginal Effects - Postwar Syria	0.008	0.025*	0.008	0.017	0.008	0.017*
	(0.006)	(0.013)	(0.006)	(0.011)	(0.006)	(0.010)
Unobserved Heterogeneity	No	Yes	No	Yes	No	Yes
Baseline Hazard	Piecewise constant	Piecewise constant	Cubic Polynomial	Cubic Polynomial	Cubic Polynomial	Cubic Polynomial
Baseline Hazard varies by Marriage Age	No	No	No	No	Yes	Yes
Mean	0.015	0.015	0.015	0.015	0.015	0.015
Observations	7,607	7,607	7,607	7,607	7,607	7,607
Number of Women	681	681	681	681	681	681

Notes: a) The data come from the 2017-18 Jordan Population Family and Health Survey, Women Module (IR) - Domestic Violence Sample. The sample includes all 15- to 49-year-old ever-married Syrian women. The sample is put into a discrete-time duration analysis structure, in which each period is one year and failure is exposure to first physical IPV event. The event history starts at marriage year for all women and continues until the year of the first IPV exposure for ever-exposed women and until the survey year, 2017-18, for never-exposed women. For ever-exposed women, the outcome variable takes the value of one at the year of first exposure and zero at all other years. For never-exposed women, the outcome variable is right-censored and takes the value of zero at all years.

b) Each column displays the results of a separate logit regression. The estimates for the two key variables of interest, Jordan and post-war Syria, are provided. The baseline category is pre-war Syria. All regressions include the following control variables: type of place of residence ([i] urban, [ii] rural) and region of place of residence ([i] north, [ii] central, [iii] south). As the baseline hazard, columns (1) and (2) include dummies for years since marriage intervals, whereas columns (3) to (6) include a cubic polynomial in years since marriage. In addition, columns (1) to (4) include dummies for marriage age intervals as control varibles, whereas columns (5) and (6) interacts the baseline hazard in cubic polynomial of years since marriage with dummies for marriage age. The even-numbered columns control for unobserved heterogeneity assuming a normal distribution with zero mean and finite variance for the unobserved individual-specific term. The standard errors are clustered at the individual level. * indicates significance at 10%, ** significance at 5%; and *** significance at 1%.

Table 2: Eliminating Potential Compositional Effects and Reducing Recall Bias

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A) Compositional Selection		B) Recall Bias					
	Women married before the civil war began		Age<=30 at survey time		Married for less than 15 years at survey time		Married for less than 10 years at survey time	
In Jordan	0.526	0.824	0.766*	1.298**	0.428	1.338**	0.407	1.764**
	(0.421)	(0.512)	(0.400)	(0.653)	(0.288)	(0.557)	(0.381)	(0.834)
Postwar Syria	0.666*	0.857*	0.665	0.949	0.587*	1.336**	0.586	1.811**
	(0.358)	(0.464)	(0.461)	(0.670)	(0.330)	(0.535)	(0.412)	(0.769)
Marginal Effects								
In Jordan	0.008	0.021	0.018*	0.032**	0.010	0.041**	0.013	0.056**
	(0.008)	(0.014)	(0.010)	(0.016)	(0.007)	(0.017)	(0.012)	(0.024)
Postwar Syria	0.011	0.023	0.017	0.027	0.016	0.046**	0.021	0.069**
	(0.007)	(0.014)	(0.015)	(0.021)	(0.011)	(0.019)	(0.017)	(0.030)
Unobserved Heterogeneity	No	Yes	No	Yes	No	Yes	No	Yes
Mean	0.013	0.013	0.023	0.023	0.024	0.024	0.032	0.032
Observations	6,748	6,748	2,031	2,031	3,257	3,257	1,828	1,828
Number of Women	462	462	323	323	452	452	336	336

Notes: a) The data come from the 2017-18 Jordan Population Family and Health Survey, Women Module (IR) - Domestic Violence Sample. The data include 15- to 49-year-old ever-married Syrian women. In panel (A), the sample is restricted to women who were married before the civil war began. In panel (B), the sample is restricted to women who are 30 years old or younger at the survey date in columns (3) and (4), to women who have been married for 15 or fewer years in columns (5) and (6), and to women who have been married for 10 or fewer years at the survey date in columns (7) and (8). The sample is put into a discrete-time duration analysis structure, as explained in Table 1.

b) Each column displays the results of a separate logit regression. The baseline hazard is piecewise constant (dummies for years after marriage intervals). The estimates for the two key variables of interest, Jordan and post-war Syria, are provided. The baseline category is pre-war Syria. All regressions include the following control variables: type of place of residence ([i] urban, [ii] rural) and region of place of residence ([i] north, [ii] central, [iii] south). The baseline hazard includes dummies for years since marriage intervals. These are as explained in the text for columns (1), (2), (5), and (6), whereas they are 0-1, 2, 3-4, 5-6, 7+ in columns (3) and (4), and 0-1, 2, 3-4, 5+ in columns (7) and (8) due to data restrictions. The even-numbered columns control for unobserved heterogeneity assuming a normal distribution with zero mean and finite variance for the unobserved individual-specific term. The standard errors are clustered at the individual level. * indicates significance at 10%, ** significance at 5%; and *** significance at 1%.

Table 3: Extensions of the Baseline Model

	(1)	(2)	(3)	(4)
	Extension 1		Extension 2	
In Jordan	0.831**	1.924***	0.974***	1.360***
	(0.341)	(0.658)	(0.336)	(0.496)
In Jordan # Years in Jordan	-	-	-0.225**	-0.258*
	-	-	(0.106)	(0.148)
In Jordan # Log(Years after Marriage)	-0.470*	-0.658*	-	-
	(0.262)	(0.381)	-	-
Postwar Syria	0.679	1.518**	0.474*	0.783**
	(0.418)	(0.762)	(0.282)	(0.395)
Postwar Syria # Log(Years after Marriage)	-0.247	-0.490	-	-
	(0.324)	(0.482)	-	-
Unobserved Heterogeneity	No	Yes	No	Yes
Mean	0.015	0.015	0.015	0.015
Observations	7,607	7,607	7,607	7,607
Number of Women	681	681	681	681

Notes: a) The data come from the 2017-18 Jordan Population Family and Health Survey, Women Module (IR) - Domestic Violence Sample. The sample includes all 15- to 49-year-old ever-married Syrian women. The sample is put into a discrete-time duration analysis structure, in which each period is one year and failure is exposure to first physical IPV event. The event history starts at marriage year for all women and continues until the year of the first IPV exposure for ever-exposed women and until the survey year, 2017-18, for never-exposed women. For ever-exposed women, the outcome variable takes the value of one at the year of first exposure and zero at all other years. For never-exposed women, the outcome variable is right-censored and takes the value of zero at all years.

b) Each column displays the results of a separate logit regression. The baseline hazard is piecewise constant (dummies for years since marriage intervals). The model in columns (1) and (2) uses interactions of both the in-Jordan dummy and the postwar Syria dummy with years after marriage (which is the waiting-time concept in the duration analysis), in addition to the two dummies themselves. The model in columns (3) and (4) uses an interaction of the in-Jordan dummy with years in Jordan, in addition to the in-Jordan and postwar Syria dummies (where the baseline is prewar Syria). All regressions also include the following control variables: dummies for years after marriage intervals (baseline hazard), dummies for marriage age categories, type of place of residence ([i] urban, [ii] rural), region of place of residence ([i] north, [ii] central, [iii] south). The even-numbered columns control for unobserved heterogeneity assuming a normal distribution with zero mean and finite variance for the unobserved individual-specific term. The standard errors are clustered at the individual level. * indicates significance at 10%, ** significance at 5%; and *** significance at 1%.

Table 4: Employment Outcomes and Asset Holdings in Prewar Syria and Jordan

	Pre-war Syria	Jordan
A) Employment Levels		
Married Men (aged 18-59)	0.93	0.71
Married Women (aged 18-49)	0.16	0.03
B) Asset Holdings		
House Ownership	0.93	0.08
Number of Rooms in the House	3.13	2.86
Car	0.17	0.08
Washing Machine	0.95	0.92
Airconditioner	0.16	0.07
Computer	0.22	0.13
Refrigerator	0.94	0.93
Satellite	0.98	0.96

Notes: Pre-war Syria for employment comes from 2009 - SFHS data. Jordan data for employment comes from the 2017-18 Jordan Population Family and Health Survey. Pre-war data for washing machine and satellite comes from 2006 - SMICS data, while the pre-war data for other items comes from 2009 - SFHS data. In Jordan data for asset holdings is from 2017-18 Jordan Population Family and Health Survey. House ownership data for in Jordan comes from 2017-18 JPFHS Men's Data, including both alone and joint ownerships of all men (aged 15-59) or married women (aged 15-49) within the household. Household sampling weights are used. The pre-war data are weighted by the fraction of Syrians in Jordan who originated from each of 14 provinces in Syria.

Table 5: The Effect on Physical IPV Rates by Husband's Educational Attainment

A) Husbands' Employment Outcomes by Educational Attainment

	Husbands with Low Educational Attainment			Husbands with High Educational Attainment		
Age	Prewar Syria	Jordan	Loss	Prewar Syria	Jordan	*Loss*
20-24	0.91	0.56	*38%*	0.87	0.79	*9%*
25-29	0.95	0.77	*19%*	0.94	0.85	*9%*
30-34	0.97	0.77	*20%*	0.97	0.85	*13%*
35-39	0.97	0.69	*29%*	0.97	0.84	*13%*
40-44	0.92	0.53	*42%*	0.96	0.67	*30%*
45-54	0.83	0.47	*44%*	0.86	0.60	*31%*

B) Estimation Results by Husband's Educational Attainment

	(1)	(2)	(3)	(4)
	Husbands with Low Educational Attainment		Husbands with High Educational Attainment	
in Jordan	0.835**	1.648***	-0.010	0.559
	(0.340)	(0.596)	(0.295)	(0.553)
Post-war Syria	0.746*	1.326**	0.098	0.721
	(0.433)	(0.634)	(0.390)	(0.618)
Marginal Effects				
In Jordan	0.017**	0.042**	-0.001	0.017
	(0.008)	(0.016)	(0.004)	(0.017)
Postwar Syria	0.016	0.037*	0.001	0.023
	(0.011)	(0.020)	(0.006)	(0.020)
Unobserved Heterogeneity	No	Yes	No	Yes
Mean	0.018	0.018	0.015	0.015
Observations	2,799	2,799	4,808	4,808
Number of Women	253	253	428	428

Notes: Low educational attainment refers to individuals who have completed primary school education or less, while high educational attainment refers to individuals who have completed secondary school education or above. In panel (A), pre-war Syria data comes from 2009 - SFHS and Jordan data comes from 2017-18 JPFHS. Sample is restricted to ever-married sample of males. Sampling weights are used. In the pre-war Syria data, province-specific averages are weighted by the fraction of Syrians in Jordan who originated from each of the 14 provinces in Syria. In panel (B), the data come from the 2017-18 JPFHS. The data structure, dependent variable and other control variables are the same as those in Table 1. As the baseline hazard, all regressions include dummies for years since marriage intervals. The regressions in columns 1-2 include the women who have low educated husbands (completed primary school education or less) and the regressions in columns 3-4 include the women who have high educated husbands (completed secondary school education or above).

Table 6: The Effect of Refugee Density on Physical IPV Rates

	(1)	(2)	(3)	(4)
in Jordan	0.684***	0.692***	1.172***	1.330***
	(0.248)	(0.262)	(0.451)	(0.444)
Post-war Syria	0.474*	0.477*	0.738*	0.914**
	(0.280)	(0.280)	(0.417)	(0.426)
in Jordan # 2km Radius Syrian Household Density	-0.012**		-0.019*	
	(0.005)		(0.011)	
in Jordan # 5km Radius Syrian Household Density		-0.038*		-0.045
		(0.022)		(0.038)
Unobserved Heterogeneity	No	No	Yes	Yes
Mean	0.016	0.016	0.016	0.016
Observations	7,607	7,607	7,607	7,607
Number of Women	681	681	681	681

Notes: The data come from the 2017-18 JPFHS. The data structure, dependent variable, and other control variables are the same as those in Table 1. As the baseline hazard, all regressions include dummies for years since marriage intervals. In addition, each regression includes an interaction term of "in Jordan" with a measure of the regional density of the Syrian population. To generate Syrian household density, we use GPS information of Syrian households, provided by the 2017-18 JPFHS. We count the number of Syrian households residing within circular areas with a 2 and 5-kilometer radius around each Syrian household and divide it by the number of natives in the same radius to generate the density variable.

Table 7: The Effect of Armed Conflict and Forced Displacement on Marriage Hazard Rates

	(1)	(2)	(3)	(4)
	Sample 1		Sample 2	
In Jordan	0.818***	0.818***	0.984***	0.984***
	(0.076)	(0.057)	(0.087)	(0.086)
Postwar Syria	0.610***	0.610***	0.626***	0.626***
	(0.101)	(0.082)	(0.102)	(0.105)
Marginal Effects - in Jordan	0.083***	0.083***	0.107***	0.107***
	(0.009)	(0.007)	(0.013)	(0.012)
Marginal Effects - Postwar Syria	0.061***	0.061***	0.065***	0.065***
	(0.012)	(0.010)	(0.013)	(0.013)
Unobserved Heterogeneity	No	Yes	No	Yes
Mean	0.099	0.099	0.094	0.094
Observations	14,584	14,584	16,231	16,231
Number of Women	1,786	1,786	1.897	1.897

Notes: a) The data come from the 2017-18 JPFHS. The samples include 15- to 49-year-old Syrian women. The data include no information on the year of arrival for never-married women. For never-married women who live in the same household with ever-married women, we generate the year of arrival using the information for ever-married women. However, the year of arrival remains missing for 27% of never-married women. Sample 1 excludes this fraction (27%) of never-married women. Hence, when we use sample 1 in columns (1) and (2), we apply inverse probability weighting to account for never-married women who are excluded. In columns 3 and 4, we use the full sample of women by assuming that never-married women with the missing year of arrival information (27%) arrived in Jordan in 2013, the average arrival year in the sample. Note that the data exhibits little variation in the year of arrival.
b) The sample is put into a discrete-time duration analysis structure, in which each period is one age and failure is marriage. The event history starts at age 12 for all women, which is the youngest age of marriage in the data. The event history continues until the age of the first marriage for ever-married women and until the age of the survey year, 2017 or 2018, for never-married women. For never-married women, the outcome variable is right-censored and takes the value of zero at all age values.
c) Each column displays the results of a separate logit regression. The estimates for the two key variables of interest, Jordan and post-war Syria, are provided. The baseline category is pre-war Syria. All regressions include the following control variables: age dummies, type of place of residence ([i] urban, [ii] rural), region of place of residence ([i] north, [ii] central, [iii] south). The standard errors are clustered at the individual level. * indicates significance at 10%, ** significance at 5%; and *** significance at 1%.

Table 8: The Effects on Hazard Rates of Marriage Types: Cousin and Polygamous Marriages, Marriage Types by Age and Education Differences Between Spouses

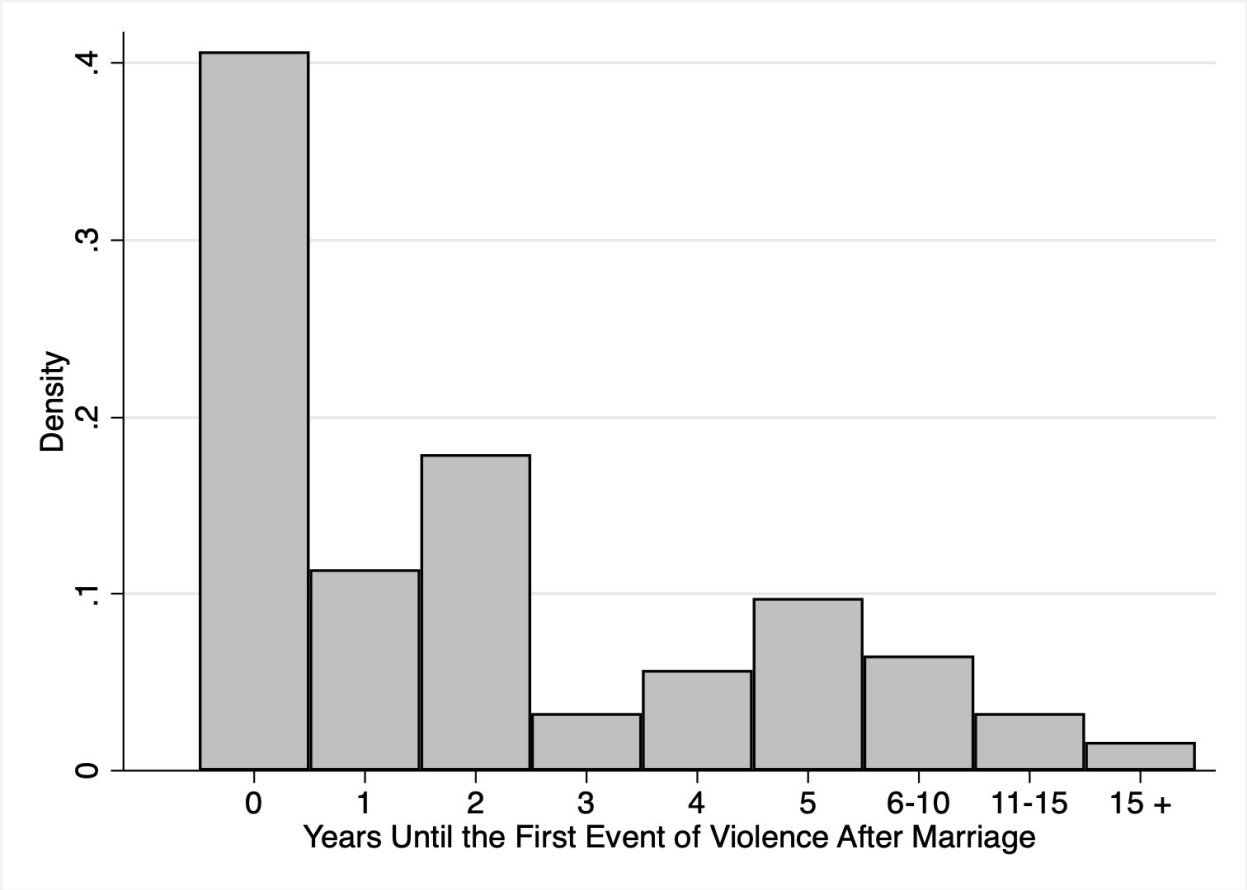
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cousin Marriage	Non-cousin marriage	Polyga-mous	Not Polyga-mous	Men 5 or more years older	Men fewer than 5 years older	Men with higher education	Men with equal or lower education
In Jordan	0.242**	1.003***	0.055	0.836***	0.525***	1.233***	0.479***	0.833***
	(0.107)	(0.066)	(0.319)	(0.060)	(0.076)	(0.176)	(0.116)	(0.065)
Postwar Syria	0.401***	0.655***	-0.540	0.629***	0.355***	0.865***	0.478***	0.562***
	(0.138)	(0.097)	(0.487)	(0.085)	(0.109)	(0.146)	(0.156)	(0.094)
Marginal Effects								
In Jordan	0.009**	0.076***	0.000	0.081***	0.031***	0.071***	0.012***	0.068***
	(0.004)	(0.006)	(0.002)	(0.007)	(0.006)	(0.013)	(0.003)	(0.006)
Postwar Syria	0.015**	0.047***	0.000	0.060***	0.021***	0.048***	0.013***	0.045***
	(0.006)	(0.008)	(0.002)	(0.010)	(0.007)	(0.010)	(0.005)	(0.009)
Mean	0.033	0.066	0.005	0.093	0.056	0.043	0.023	0.075
Observations	14,584	14.584	13,611	13,611	13,624	13,624	13,610	13,610
Number of Women	1,786	1.786	1.682	1.682	1,684	1,684	1,683	1,683

Notes: a) The data come from the 2017-18 JPFHS. The sample includes all 15- to 49-year-old Syrian women. The sample is put into a discrete-time duration analysis structure, in which each period is one age and failure is marriage. The event history starts at age 12 for all women, which is the youngest age of marriage in the data. The event history continues until the age of the first marriage for ever-married women and until the age of the survey year, 2017 or 2018, for never-married women. In all columns, the outcome variable takes the value of zero or one at the age of marriage and zero at all other ages. In column 1, the outcome variable takes the value of one at the age of marriage only if the woman marries a first-degree cousin. In column 2, the outcome variable takes a value of one at the age of marriage only if the woman marries a man who is not her first-degree cousin. In column 3, the outcome variable takes a value of one at the age of marriage only if the woman has a co-wife. In column 4, the outcome variable takes a value of one at the age of marriage only if the woman is her husband's only wife. In column 5, the outcome variable takes a value of one at the age of marriage only if the woman has married a man who is five or more years older than her. In column 6, the outcome variable takes a value of one at the age of marriage only if the woman has married a man who is less than five years older than her. In column 7, the outcome variable takes a value of one at the age of marriage only if the woman has married a man who is more educated than her. In column 8, the outcome variable takes a value of one at the age of marriage only if the woman has married a man with an equal education level or less educated than her. For never-married women, the outcome variable is right-censored and takes the value of zero at all age values.

b) Each column displays the results of a separate logit regression. All regressions account for unobserved heterogeneity. The estimates for the two key variables of interest, Jordan and post-war Syria, are provided. The baseline category is pre-war Syria. All regressions include the following control variables: age dummies, type of place of residence ([i] urban, [ii] rural), region of place of residence ([i] north, [ii] central, [iii] south). The standard errors are clustered at the individual level. * indicates significance at 10%, ** significance at 5%; and *** significance at 1%.

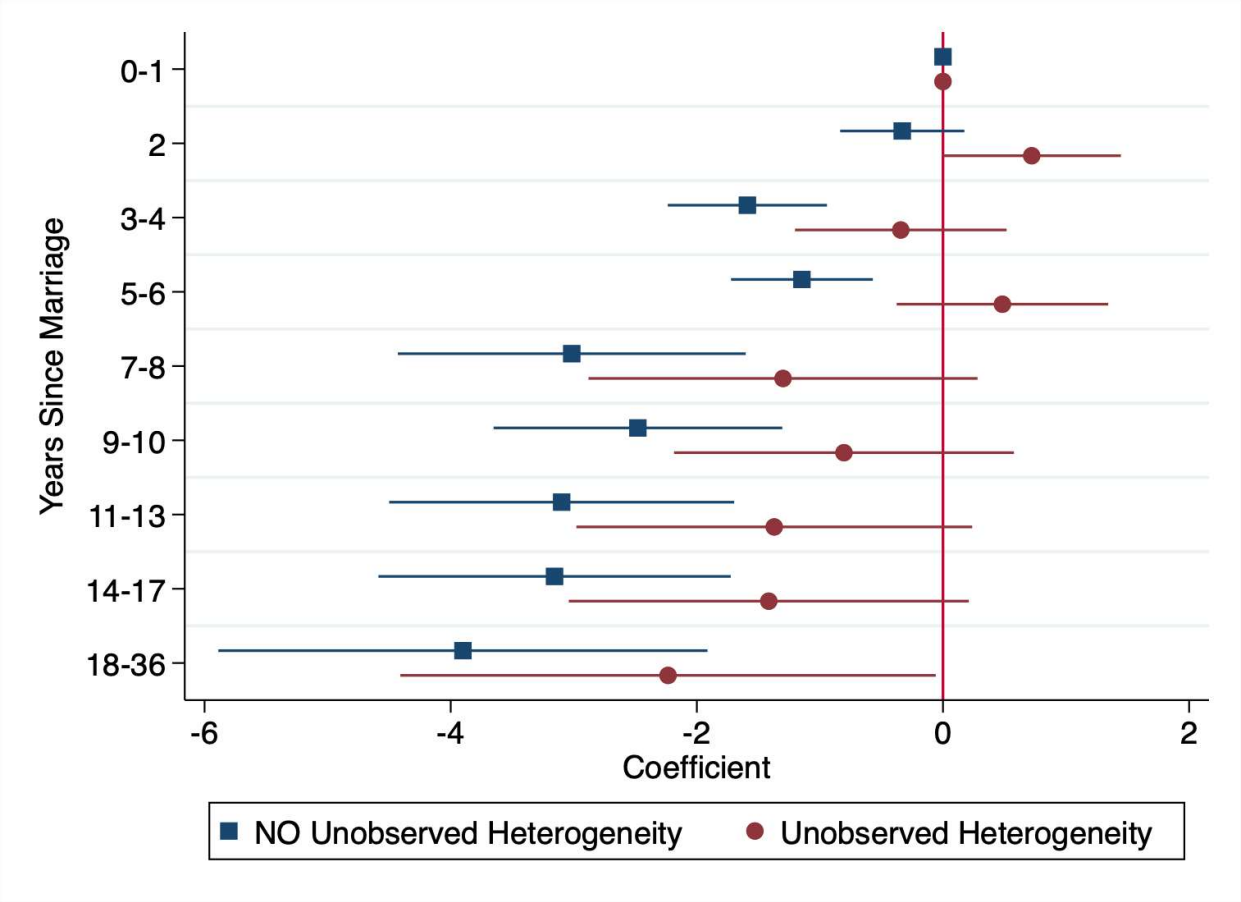
Online Appendix

Figure A1: Distribution of Years Between Marriage and The First Physical IPV Exposure



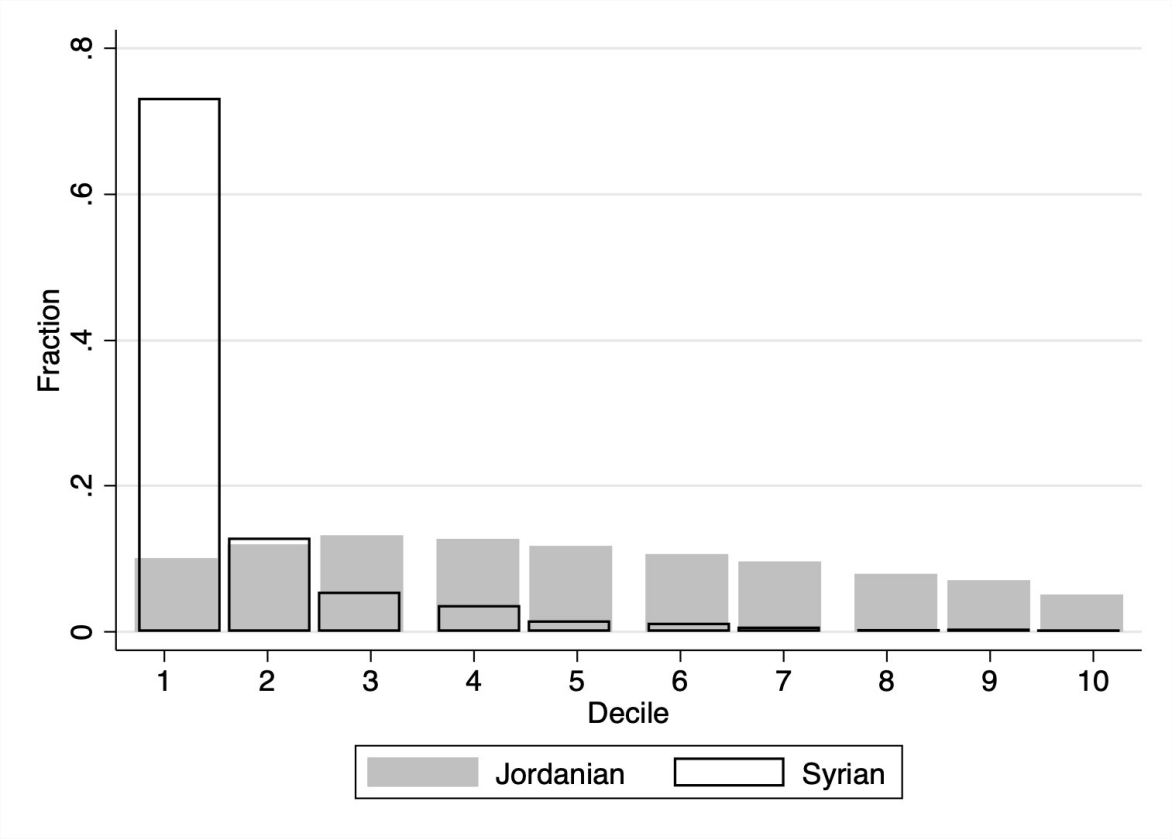
Notes: The data come from the 2017-18 Jordan Population Family and Health Survey, Women Module (IR) - Domestic Violence Sample.

Figure A2: Estimated Coefficients of Years Since Marriage Intervals with and without Unobserved Heterogeneity



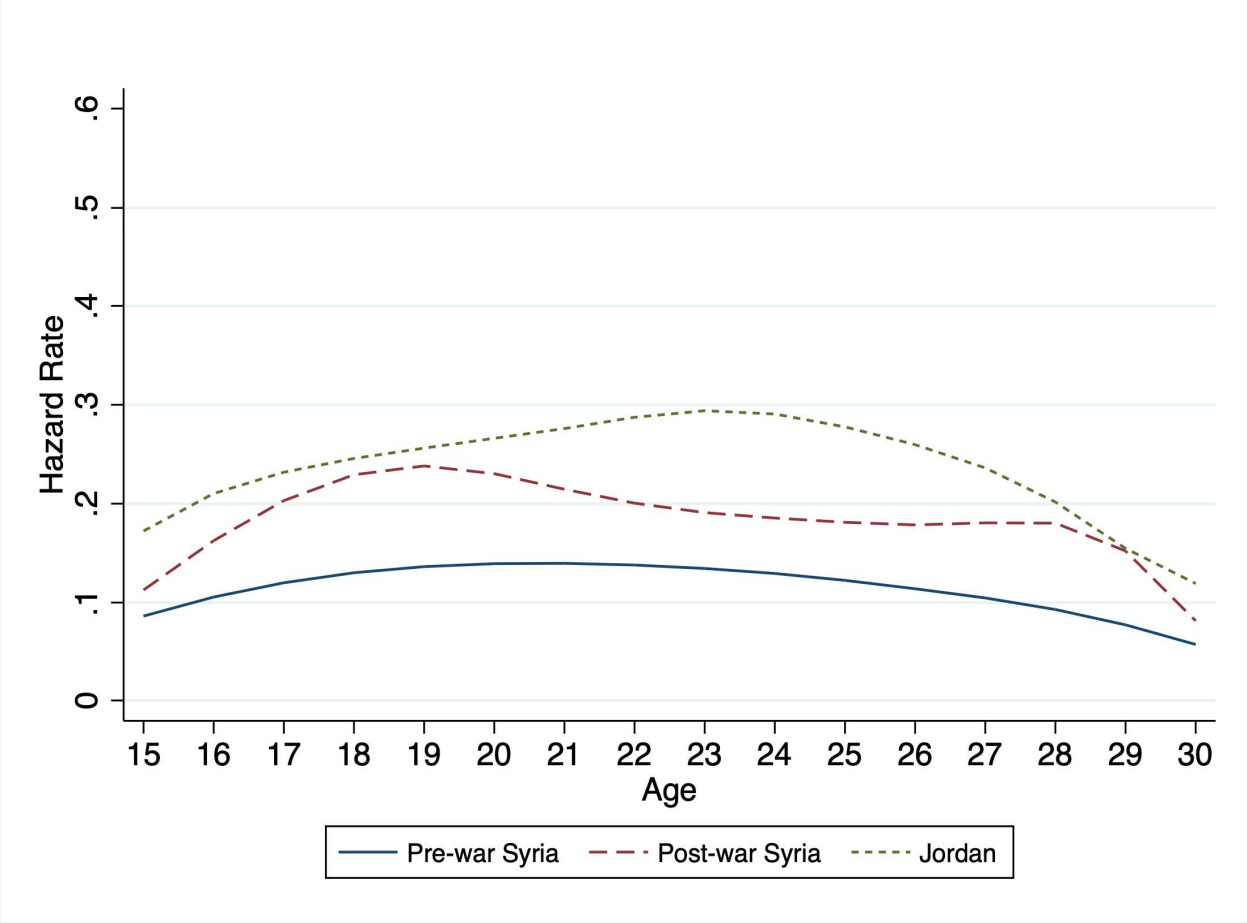
Notes: The estimates come from the specifications in columns 1 (no unobserved heterogeneity) and 2 (unobserved heterogeneity) of Table 1. The baseline hazard coefficients (dummies for years since marriage intervals) and their 95% confidence intervals are displayed.

Figure A3: Wealth Comparison of Jordanians and Syrian Refugees based on 2017-18 JPFHS



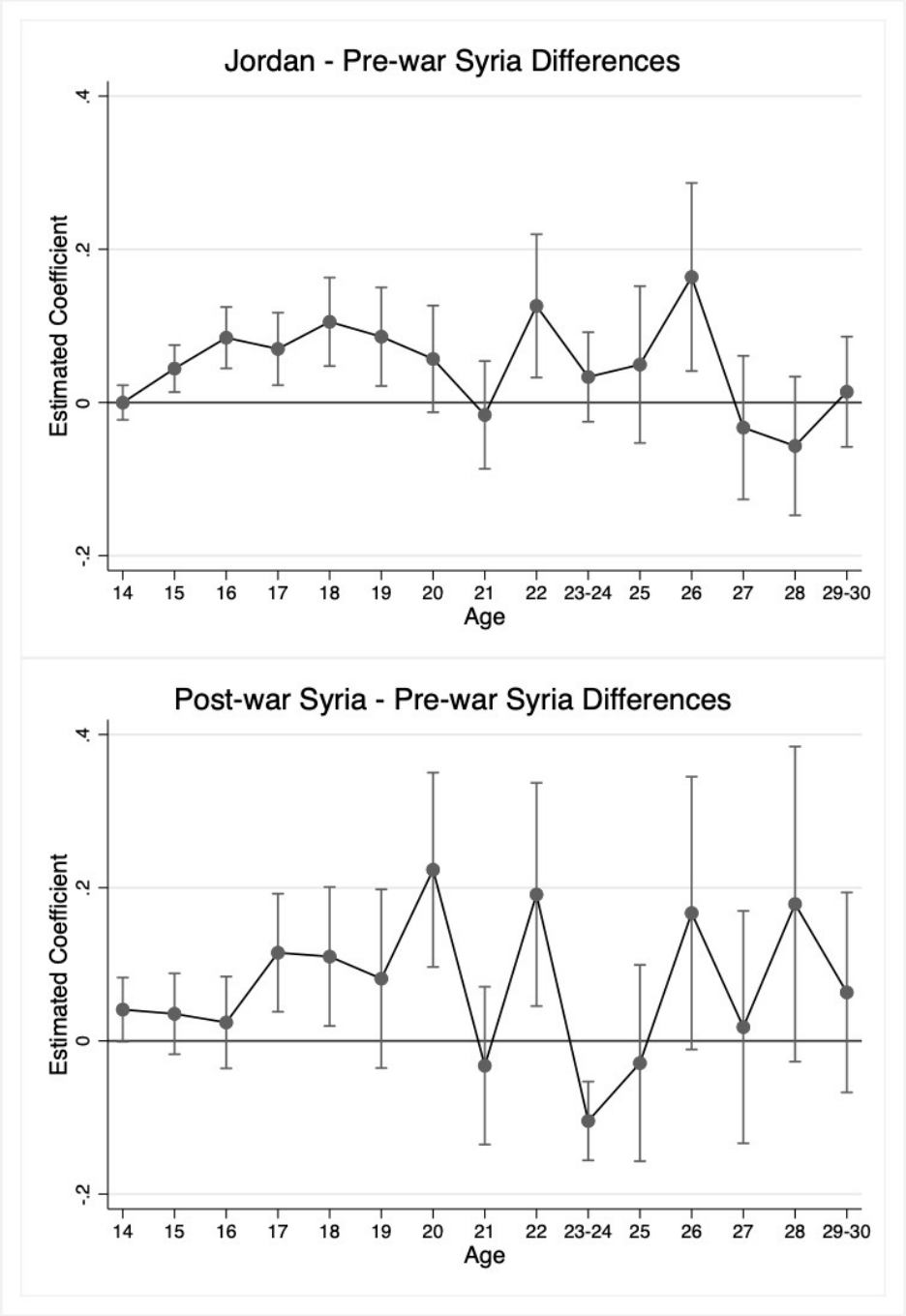
Notes: The data come from the 2017-18 Jordan Population Family and Health Survey. This figure depicts the wealth distribution of Jordanian vs. Syrian households. Data include a variable "wealth score": Households are given scores based on the number and kinds of consumer goods they own, ranging from a television to a bicycle or car, and housing characteristics such as source of drinking water, toilet facilities, and flooring materials. These scores are derived using principal component analysis. We compile wealth deciles by assigning the household score to each household member, ranking each person by his score, and then dividing the distribution into ten deciles.

Figure A4: Hazard Rates of Marriage by Age



Notes: This figure illustrates the IPV marriage hazard rates for three periods: pre-war Syria, post-war Syria, and Jordan. The data come from the 2017-18 Jordan Population Family and Health Survey. The sample includes all 15- to 49-year-old Syrian women: data on ever-married women comes from Women Module (IR) and data on single women comes from person data (PR). The sample is put into a discrete-time duration analysis structure, in which each period is one age and failure is marriage. The event history starts at age 12 for all women, which is the youngest age of marriage in the data. The event history continues until the age of the first marriage for ever- married women and until the age of the survey year, 2017-2018, for never-married women. For ever-married women, the outcome variable takes the value of one at the age of marriage and zero at all other ages. For never-married women, the outcome variable is right-censored and takes the value of zero at all age values. The hazard rates for each age are smoothed using lowess smoothing.

Figure A5: Differences in Predicted Marriage Hazard Rates by Age



Notes: The data structure, the dependent variable and other control variables, is the same as that in Table 7. The upper panel presents the coefficients of the interactions of the "in Jordan" dummy variable with age dummies, and the lower panel shows the coefficients of the interactions of the "postwar Syria" dummy variable with age dummies (where the baseline control is "prewar Syria") in an OLS regression. The 90% confidence intervals are provided.

Table A1: Prevalence of Selected Outcomes by Exposure to Physical Violence

Variables	Women Not Exposed to Physical IPV	Women Ever Exposed to Physical IPV	p-value of t-test
Other Violence Outcomes			
Experienced any control behavior (any of following 5)	0,75	0,94	0,00
Husband jealous if respondent talks with other men	0,73	0,87	0,00
Husband accuses respondent of unfaithfulness	0,03	0,15	0,00
Husband does not permit respondent to meet female friends	0,08	0,33	0,00
Husband tries to limit respondent's contact with family	0,06	0,27	0,00
Husband insists on knowing where respondent is	0,27	0,67	0,00
Experienced any emotional violence (any of following 3)	0,08	0,69	0,00
Ever been humiliated by husband	0,05	0,49	0,00
Ever been threatened with harm by husband	0,00	0,17	0,00
Ever been insulted or made to feel bad by husband	0,05	0,59	0,00
Beating Justified Under Certain Circumstances			
Beating justified if wife goes out without telling husband	0,13	0,18	0,12
Beating justified if wife neglects the children	0,12	0,20	0,02
Beating justified if wife argues with husband	0,11	0,17	0,05
Beating justified if wife burns the food	0,03	0,07	0,05
Beating justified if wife insults	0,30	0,48	0,00
Beating justified if wife disobeys	0,20	0,31	0,01
Beating justified if wife has relations with another man	0,62	0,70	0,11
Decision Making: Contributes to the Decision			
Women can decide on her health care	0,87	0,81	0,18
Women can decide on large household purchases	0,72	0,60	0,01
Women can decide on visits to family or relatives	0,81	0,76	0,25
Women can decide on what to do with money husband earns	0,68	0,56	0,03

Notes: The data come from the 2017-18 Jordan Population Family and Health Survey, Women Module (IR) - Domestic Violence Sample. Two samples t-test p-values are reported.

Table A2: An Illustration of the Data Structure

Woman ID	Survey Age	Marriage Age	Age of First Exposure	Arrival Year	Age	Time	Year	Exposed	Post-war Syria	In Jordan
111111	32	25	30	2013	25	0	2010	0	0	0
111111	32	25	30	2013	26	1	2011	0	1	0
111111	32	25	30	2013	27	2	2012	0	1	0
111111	32	25	30	2013	28	3	2013	0	0	1
111111	32	25	30	2013	29	4	2014	0	0	1
111111	32	25	30	2013	30	5	2015	1	0	1
222222	32	24	26	2013	24	0	2009	0	0	0
222222	32	24	26	2013	25	1	2010	0	0	0
222222	32	24	26	2013	26	2	2011	1	1	0

Notes: The table provides two examples of women in our sample. Both women are born in 1985 and arrive in Jordan in 2013. However, the first woman is married at age 25 and first exposed to IPV at age 30 (in 2015), after she arrives in Jordan; whereas the second woman gets married at age 24 and first exposed to IPV at age 26, in post-war Syria, 2011.

Table A3: The Effect on IPV by Husband's Educational Attainment – Robustness Check using Women Married Before the War

	(1)	(2)	(3)	(4)
	Husbands with Low Educational Attainment		Husbands with High Educational Attainment	
in Jordan	1.116	1.539*	0.108	0.202
	(0.734)	(0.923)	(0.534)	(0.609)
Post-war Syria	1.343***	1.720**	0.193	0.276
	(0.501)	(0.771)	(0.518)	(0.606)
Marginal Effects				
In Jordan	0.021	0.037	0.001	0.005
	(0.020)	(0.026)	(0.007)	(0.015)
Postwar Syria	0.028*	0.046*	0.003	0.007
	(0.016)	(0.026)	(0.008)	(0.016)
Unobserved Heterogeneity	No	Yes	No	Yes
Mean	0.013	0.013	0.013	0.013
Observations	2,481	2,481	4,267	4,267
Number of Women	173	173	289	289

Notes: The data comes from the 2017-18 JPFHS. The sample is restricted to women who married before 2011. The data structure, dependent variable and other control variables are the same as those in Table 1. As the baseline hazard, all regressions include dummies for years since marriage intervals. The regressions in columns 1-2 include the women who have low educated husbands (completed primary school education or less) and the regressions in columns 3-4 include the women who have high educated husbands (completed secondary school education or above).

Table A4: Robustness Check - Change in Age Differences

	(1)	(2)	(3)	(4)
	Men 3 or More Years Older	Men Less Than 3 Years Older	Men 10 or More Years Older	Men Less Than 10 Years Older
In Jordan	0.695***	0.932***	0.478***	0.829***
	(0.065)	(0.111)	(0.134)	(0.063)
Postwar Syria	0.449***	0.827***	0.515***	0.558***
	(0.096)	(0.151)	(0.178)	(0.092)
Marginal Effects - in Jordan	0.055***	0.028***	0.009***	0.072***
	(0.006)	(0.004)	(0.003)	(0.006)
Marginal Effects - Postwar Syria	0.034***	0.025***	0.010***	0.047***
	(0.008)	(0.006)	(0.004)	(0.009)
Unobserved Heterogeneity	Yes	Yes	Yes	Yes
Mean	0.074	0.024	0.017	0.082
Observations	13,624	13,624	13,624	13,624
Number of Women	1.684	1.684	1.684	1.684

Notes: This table presents a robustness check of Table 8, where an age difference of five is tested. Here, columns 1-2 conduct the same test with an age difference of three, while columns 3-4 conduct the same test with an age difference of ten.