The London School of Economics and Political Sciences

Armed conflict and family outcomes: The consequences of exposure to war on fertility, teen marriage and intimate partner violence

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Declaration of authorship

I certify that the thesis I have presented to the Department of Social Policy of the London School of Economics and Political Science for examination for the PhD degree in Demography/Population Studies is exclusively my own work. I am the sole author of all its Chapters.

The main findings of this thesis have been published in or have been accepted for publication in peer-reviewed journals. The references to these articles are:

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Torrisi, O. (2022). Wedding amidst war? Armed conflict and female teen marriage in Azerbaijan. *European Journal of Population*, 38, 1243–1275. https://doi.org/10.1007/s10680-022-09645-0

Torrisi, O. (2022). Young-age exposure to armed conflict and women's experiences of intimate partner violence. *Journal of Marriage and Family*. https://doi.org/10.1111/jomf.12876

The results of this thesis have also been covered in several international news blogs and media outlets, including *Osservatiorio Balcani Caucaso - Transeuropa, AZERTAC* and *Demotrends*.

Abstract

This thesis focuses on the consequences of armed conflict on family-related outcomes. Whilst remarkable efforts have been devoted towards documenting conflict-caused excess mortality, tracing and forecasting migratory responses to war, demographic research has dedicated less attention to events occurring around the family domain in and after wartime. Yet, the family remains a fundamental component of population dynamics, and a crucial institution for individual well-being, community resilience and post-conflict social stability.

This thesis addresses this knowledge gap in three empirical Chapters. Each examines the consequences of exposure to armed conflict on aspects of family formation, including fertility and marriage, and issues of family violence. Particular attention is given to experiences of conflict violence in early and young life, understood as key developmental stages and critical periods for later life outcomes. The research questions are examined in the context of the armed confrontations that characterised the former Soviet space, with emphasis on Azerbaijan and its conflict with Armenia over Nagorno-Karabakh.

The first paper focuses on childbearing transitions. Using birth history data and demographic methods, it retraces fertility trends and patterns in Azerbaijan and examines how these have changed since independence and in relation to the Nagorno-Karabakh conflict. The paper finds that, while conflict exposure had little influence on aggregate fertility trends, it affected differently the transition to different parities. In specific, it shows that exposure to war is associated with a higher risk of transitioning to the average parity level in the population, that in the Azerbaijani context is the second birth. It further documents 'promoting' effects on fertility after the loss of a child during the conflict, suggesting risk-insurance and replacement mechanisms as responses to traumatic conflict events.

The second paper addresses the question of whether armed conflict influences the other component of family formation, i.e., the timing of marriage. In particular, it examines female teen marriage dynamics in the context of the Nagorno-Karabakh conflict in Azerbaijan. Exploiting spatial variation in conflict violence and a cohort specification that accounts for the risk of marrying in teen ages

before and during the war, the paper provides suggestive evidence of declines in adolescent unions for the cohorts longest exposed to the conflict and highlights the role of displacement as a plausible driver. Yet, it also finds that conflict only leads to marriage postponement and is associated with theoretically adverse union characteristics, including wider spousal age and educational differences. This opens questions on how war may influence family intimate relationships.

The third paper turns attention to this aspect and asks whether exposure to violence at young ages is correlated with women's adult experiences of intimate partner violence (IPV). This is the first study to integrate theoretically and empirically literature on the long-term consequences of warfare and the scholarship on the determinants of IPV. Expanding the spatial reach of the research to all ex-Soviet states that experienced armed violence after independence (Armenia, Azerbaijan, Moldova and Tajikistan), and exploiting cohort and geographical variation in conflict exposure, it finds that women affected by conflict in childhood have an elevated probability of being IPV victims, particularly of physical and sexual abuse, compared to not-exposed peers and older women. Analyses of potential pathways show no relationship between war exposure and changing marriage market conditions, or attitudes towards IPV in women. Conversely, men exposed to war in late adolescence (16-19) are more likely to condone violence against partners. Further, women's childhood exposure to conflict correlates with having a violent father.

Altogether, the findings advance our theoretical understanding of family formation processes in times of conflict as well as of the long-term consequences of war may have on other forms of violence that hinder family functioning. They are also policy-relevant and serve as inputs for the design of strategies that can foster family well-being and welfare in post-conflict Eurasia, the development of prevention programmes in conflict-prone areas in the region and timely responses where conflict violence is ongoing, like in Ukraine.

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Most importantly, none of this could have happened without my parents, Beatrice and Rino, who constantly show their endless love and support, especially when they pretend to understand my papers and fake fluency in English. This work is dedicated to you and le nonne Iva and Concetta.

A Mati e Pati, Iva e Concetta.

To the people of Zahle, Beqaa Valley.

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List of acronyms

ASFR	Age-Specific Fertility Rate
AIC	Akaike's Information Criterion
DHS	Demographic and Health Survey
DID	Difference in Difference
DRS	Districts of Republican Subordination
DV	Domestic Violence
GBAO	Gorno-Badakshan Autonomous Oblast
GBV	Gender-Based Violence
HRW	Human Rights Watch
IPV	Intimate Partner Violence
LMICs	Low- and Middle-Income Countries
LSS	Living Standards Survey
NKAO	Nagorno-Karabakh Autonomous Oblast
PPR	Parity Progression Ratios
SCM	Synthetic Cohort Method
SSR	Soviet Socialist Republic
TFR	Total Fertility Rate
TMFR	Total Marital Fertility Rate
UCDP-GED	Uppsala Conflict Data Programme Geo-referenced Event Dataset
UNDP	United Nations Development Programme
UNFPA	United Nations Fund for Population Activities
UNGA	United Nations General Assembly
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
URSS	Union of Soviet Socialist Republics
UTO	United Tajik Opposition
WHO	World Health Organization

Chapter 1

Introduction

"Conflict is part of the human condition and therefore should be integral to all analyses and interpretation of demographic behaviour" (Randall 2005: p.292)

Armed conflict is a persistently pervasive phenomenon and a complex global challenge for current and future population dynamics (Brunborg and Urdal 2005; World Bank 2017). As a discipline, demography has been traditionally sensitive to issues of armed violence, particularly from a 'fast demography' perspective (Billari 2022). Scholars in the field have in fact greatly contributed to documenting some of the most immediate and manifest costs of war: excess mortality and forced migration (Brunborg 2003; Brunborg et al. 2003). In more recent times, the evolution of modern conflicts into less deadly, but longer confrontations characterised by waves of varying intensity (Strand and Hegre 2021), has opened new questions and attracted interest in a 'slower demography' approach, increasingly concerned with the indirect and long-term implications of warfare for population processes. This thesis focuses on the family domain as part of this recent effort to build a richer understanding of the demographic consequences of war and violence.

Family outcomes and behaviours have generally received little consideration in demographic studies of armed conflicts (Brunborg and Urdal 2005). For long, family processes, such as fertility and marital behaviour, have been regarded as "low-priority", or at least "secondary" to more immediate needs, like documenting casualties and injuries, tracing and monitoring population movements for protection

(Onyango et al. 2013; Hill 2004). Attention to family relationships, dissolution and issues of family violence in and after wartime has been even scarcer (Østby 2016). Altogether, this oversight has led to a dearth of timely, large-scale, high-quality data and, inevitably, limited evidence, even in the post-emergency period (Hill 2004; Hynes et al. 2002).

However, understanding family dynamics in war zones is paramount for several reasons. First, family processes are a central determinant of population change (Pesando 2019). Knowledge of family formation behaviour in and after conflict matters for understanding and advancing theory on the drivers of contemporary and long-term population dynamics. Second, the family is the building unit of human society in virtually all cultures and places (Seltzer 2019). In peaceful times, its functioning is fundamental to individual perceptions of life quality and well-being (Alesina and Giuliano 2010); in wartime, it further represents a critical asset for people's coping strategies and an important component of peacebuilding efforts (de Jong 2020; MacDermid Wadsworth 2010; Schöb 2016). Third, while the focus on mortality enabled demographic research to successfully document the large direct impacts war has on men, attention to the family domain is necessary to gain an empirical understanding of the many indirect, yet insidious challenges conflict brings to women and girls' life trajectories (Patel et al. 2009). Fourth and related, if knowledge about family formation processes is essential to inform family and women-targeting policies and to sustain human security in peaceful contexts, it matters even more in conflict and post-conflict settings, where such programmes and often dedicated institutions do not exist and have to be created from scratch (McGinn 2000).

This dissertation is therefore a study of the consequences of armed violence on various aspects related to the family domain. I begin by focusing on the key demographic components involved in the formation of families – fertility and marriage – and address two empirical questions linked to the fundamental debate on how individuals make family decisions *vis-à-vis* challenges and uncertainty:

1) *Does armed conflict influence fertility?*
2) *Does armed conflict influence women's early transition to union formation?*

Next, I move past family formation processes and consider whether armed violence exerts any lasting influence on intimate relationships by asking:

3) *Does conflict exposure at young-ages influence women's later experiences of intimate partner violence (IPV)?*

These overarching questions are examined in the context of the armed confrontations that occurred in the ex-Soviet space after the USSR dissolution, and particular attention is given to the Nagorno-Karabakh conflict in Azerbaijan. The Soviet demise in 1991 has been one of the world's most important geo-political events, and as such, it attracted major research interest. Demographers studied in detail its impact on individual demographic behaviour and aggregate population components (e.g., Sobotka 2004; Sobotka et al. 2003); but what was largely overlooked at the time and afterwards was that the dis-union did not happen peacefully. At least, not in all new independent States. Within weeks of the collapse, armed conflicts moved by nationalist drives, ethnic tensions and territorial claims erupted across Eurasia[1], lasting several years. Armenia, Azerbaijan, Moldova and Tajikistan in particular experienced serious conflict violence that, together with the economic and social reconfiguration underway, deeply affected their societies, populations and family dynamics (Billingsley 2011; Clifford et al. 2010). Perhaps not coincidentally, these countries remain the least studied in the post-Soviet demographic literature.

In the next sections of this Introduction, I provide a review of the state-of-the-art of research on fertility, marriage and IPV in the context of armed conflicts, and highlight the knowledge gaps driving my research questions. I then describe the research settings (Armenia, Azerbaijan, Moldova and Tajikistan), providing background on their demographic and conflict history. The remainder introduces the data and empirical methodologies adopted in the thesis, reflecting on challenges and choices. I conclude by summarising the chapters and the overall contributions of this dissertation.

[1] Throughout this thesis I use the term "Eurasia" to refer to countries belonging to the Soviet bloc until the collapse of the USSR and whose borders as independent states straddle across the European and Asian continents. That is present-day Armenia, Azerbaijan, Georgia, Moldova, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. I use the term "South Caucasus" when I exclusively refer to the former three, and "Central Asia" to indicate the other five.

1.1 Armed conflict and the family

1.1.1 *The concept of armed conflict*

The concept of armed conflict is central to this thesis. However, prior to any discussion of its consequences on the family domain, it is essential to note that, to date, there is neither a terminological consensus nor a uniformly agreed definition of armed conflict (Graham 2012).

Since the 1949 Geneva Conventions and the 1977 Additional Protocols, international law has categorised modern situations of armed violence as international or internal (alternatively, domestic or civil) and, importantly, preferred the term "armed conflict" to "war" to describe them. This terminological choice was intended to ensure an effective extension of legal instruments to forms of violence beyond officially declared war between sovereign entities – no matter their duration, intensity or destructiveness. However, the treaties did not provide a definition of what constitutes armed conflict and what differentiates it, if anything, from war (Bartels 2020). Relatedly (and consequently), empirical research concerned with contemporary violence has flexibly treated the terms "war" and "armed conflict" as synonymous. In this work, I adopt this stance and use the terms interchangeably, albeit favouring "armed conflict" as much as possible due to its broader scope and in line with international law.

The lack of a universally agreed terminology and definition has also made the notion of "armed conflict" hardly amenable to any scientific litmus test (Berman 2004). Depending on the field, scholarly research has thus defined and operationalised the concept in a variety of ways. Sociologists have generally discussed armed conflict as a multi-dimensional social phenomenon, broadly defined as a culture or process of social militarisation (Cock 2004; Doucet 1997; Scruton 1987). Political scientists have, instead, focused more on identifying categories (e.g., inter- vs. intra-state, conventional vs. hybrid) and establishing quantifiable criteria in terms of scale and/or intensity (e.g., number of deaths) to determine when certain actions reach a level that can be defined an "armed

conflict" (Gleditsch et al. 2002)[2], whereas feminist approaches have highlighted the limitations of thinking about war and peace in dichotomous terms (Gray 2019).

Post-Soviet conflicts, with their many "grey areas", including overlapping instances of international and internal violence, blurred borders and often 'frozen' status, provide rich material for definitional debates of this kind (Baev 2007; Lynch 2002; Sambanis 2004). I will give a sample of the discussion when I describe the conflicts under study and the data. The substantive result of these analyses has nevertheless been again that a single, uniform definition of armed conflict, or war, in these contexts is not possible and, perhaps not even necessary or helpful. Drawing from this perspective, this work does not propose a working definition of armed conflict that, for example, requires strict thresholds to be satisfied. In what comes next, instead, I build on the complexities of each case to offer an illustrative picture of the challenges and opportunities associated with studying the demographic consequences of a dynamic phenomenon, difficult to characterise, like armed conflict.

1.1.2 *Armed conflict and fertility*

The question of how armed conflict influences fertility first came to the front after the World Wars, with historical studies documenting significant wartime drops in total fertility followed by compensatory post-conflict rebounds (or "baby booms") in Western countries (Henry 1966; Hobcraft 1996; Rindfuss and Sweet 2006). Since then, research on more recent conflicts and low- and middle-income countries (LMICs) emerged very slowly and produced less consistent results. Although for the most part extant studies still suggest conflict-related (often temporary) declines in total fertility (e.g., Alburez-Gutiérrez (2018) in Guatemala; de Walque (2005) in Cambodia; Thiede et al. (2020) in sub-Saharan Africa), some analyses find null as well as positive fertility responses to conflict violence (e.g., Abbasi-Shavazi et al. (2009) in Iran; Saxena et al. (2004) in Lebanon; Cetorelli (2014) in Iraq; Castro Torres and Urdinola (2019) in Colombia).

[2] For example, the Correlates of War project defines armed conflict as combat causing "a minimum of 1,000 battle-related within a twelve-month period" (Sarkees and Wayman 2010: p.1). The UCDP as "a contested incompatibility between at least two parties resulting in at least 25 battle-related deaths in one calendar year" (Croicu and Sundberg 2016: p.2).

In line with this empirical ambiguity, multiple, possibly offsetting pathways have been hypothesised (yet seldom tested) as drivers of fertility changes in conflict-affected settings. The channels can be categorised as *direct/intentional* and *indirect/involuntary*. Direct factors leading to delays or reduction in childbearing include conscription, spousal separation, population displacement, and economic hardship (Hill 2004; Thiede et al. 2020). Economic factors and uncertainty may though have the opposite effect if, for example, having additional children is perceived as a way to increase household future income sources (Rosenzweig and Schultz 1983; Verwimp and Bavel 2005). Couples may deliberately increase their fertility as a response to the death of a child or to the expectation that some already-born ones will not survive (Kraehnert et al. 2019). Indirect mechanisms instead relate to psychological, biological and structural factors. For instance, conflict could depress childbearing because of increased stress and/or because of infecundability related to maternal malnutrition (Palloni et al. 1996; Van Herp et al. 2003). Alternatively, war may lead to increased fertility as a result of the higher incidence of sexual violence, lack of access to contraception and pro-natalist policies (Cohan and Cole 2002; Fargues 2000).

Evidently, available evidence highlights more the heterogeneity in fertility responses to conflict violence and the complexity of explanatory pathways than it suggests a clear direction in the association. This in part relates to the coarse and varied ways in which conflict exposure is measured in the existing literature. I will return to this point later in the section "Data and methodological approach". A major limitation of extant research, though, is that it has predominantly focused on aggregate outcomes, without paying sufficient attention to how responses to conflict violence are contingent on the broader fertility dynamics and trends of the affected population. Overlooking pre-existing characteristics and considering only aggregate fertility measures can conceal differential responses by parity. In turn, this may result in a partial and, perhaps inaccurate depiction of childbearing behaviour in conflict zones. For a correct appraisal, it is critical to consider the population's stage in the fertility transition at the time of war, to identify the birth transition most "susceptible" to changes and to evaluate whether and how this and/or other parities separately respond to conflict violence.

1.1.3 *Armed conflict and marriage*

The influence of violent conflict on birth outcomes may be preceded by shifts in union formation, especially in traditional societies where marriage is a major determinant of fertility (Thiede et al. 2020). However, research attention to whether and how conflict can change incentives for marriage, and its likelihood has been very modest. Theoretical expectations are, again, ambiguous. On the one hand, armed conflict may hasten union formation through mechanisms that include the search for economic and/or physical security for women and their families, nationalist pro-natalist policies and reinforced gender roles (Randall 2005; Sieverding et al. 2020; Valente 2011). Alternatively, it may induce marriage postponement because of financial hardship, displacement or because of structural factors like changes in population structure (e.g., 'groom deficits'), social trust and networks (Shemyakina 2013; Staveteig 2011).

As for fertility, this conceptual ambiguity is reflected in an inconsistent empirical record, largely limited to analyses of national marriage rates tracking pre-post changes (Khawaja and Randall 2006; Saxena et al. 2004; Verpoorten and Schindler 2012). The tendency to focus on the 'aggregate' implies that we know little about how conflict shapes the timing of marriage. This is of concern because marrying at an early age has different implications than marrying in adulthood for the life chances of women and their children, as well as for the stability, quality and functioning of marital unions (Dahl 2010; Garcia-Hombrados and Ozcan 2022; Kiernan 1986; Sunder 2019). These consequences are, in essence, all harmful (UNICEF 2005). Knowing if conflict affects union formation, if it does at young ages, and for girls in particular, is thus a pressing concern. Answers to this question are of utmost importance to safeguard their self-development, well-being and long-term outcomes.

1.1.4 *Armed conflict and intimate partner violence*

The consequences of armed violence on the family extend beyond family formation processes. War impacts many other aspects of family life, including the personal relationships between family members (MacDermid Wadsworth 2005; Østby 2016). Of particular concern is the connection with

IPV[3], a complex form of family violence, a violation of human rights and a public health issue that is too often presented as a private matter disconnected from outside forces and events (United Nations General Assembly (UNGA) 1993; WHO 1997). Not only studies have shown that IPV remains the most common type of gender-based violence (GBV) against women in war settings (Stark and Ager 2011); but there is also mounting evidence that its prevalence intensifies during and after episodes of conflict, for reasons that include educational losses, changing marriage-market conditions and/or the emergence of violence-permissive cultures (La Mattina 2017; La Mattina and Shemyakina 2017).

Until now, this new research strand has been concerned with the contemporaneous effect of armed violence on IPV. It has not yet explored how long the relationship may last. Relatedly, we do not know if the timing of war – when, during the life-course, exposure to armed violence occurs – matters for long-term outcomes. These are theoretically relevant questions given the well-established link between young-age exposure to other kinds of violence (e.g., within the family, in schools) and adult victimisation in intimate relationships (Bandura 1977; Desai et al. 2002), as well as given the numerous scarring consequences childhood exposure to war has on other later-life outcomes (Kadir et al. 2019; Schneider et al. 2021).

Considering the ages at conflict exposure is important to deepen our conceptual understanding of the extent to which, and for how long, war shapes women's life-course trajectories. It also serves to broaden theory on the interconnections between different forms of violence. This knowledge is key to informing programmes that can protect victims of double violence, prevent 'ripple' effects and support lasting peace.

1.2 The research settings

The knowledge gaps emphasised above are markedly noticeable in relation to the violent conflicts that erupted in Eurasia soon after the Soviet Union collapsed. This may not be surprising since the

[3] The WHO (1997) defines IPV as "any behaviour within an intimate relationship that causes physical, psychological or sexual harm to those in the relationship" (p.89). In this thesis, I use the term interchangeably with domestic violence and spousal abuse because the most violent acts against women within the family is perpetrated by their partners (Aizer 2010), and only consider male-to- female interpersonal violence.

end of the USSR has been typically portrayed as a "uniquely peaceful geo-political catastrophe" (Baev 2007: p.250). In reality, its demise created fluid borders, ethnolinguistic fragmentation and, often, turbulent chaos. In Armenia, Azerbaijan, Moldova and Tajikistan, this culminated in intense violent conflicts. I next introduce these settings and reconstruct their conflict histories as objectively as available information allows.[4]

1.2.1 *Armenia, Azerbaijan and the Nagorno-Karabakh conflict*

Armenia and Azerbaijan are located in the South Caucasus, a region at the crossroads of Europe and Western Asia and a bridge between the Christian and Islamic civilisations. The two bordering countries have respectively a population of just under 3 and about 10 million inhabitants and are both characterised by a considerable diaspora (Statistical Committee of the Republic of Armenia 2021; Azerbaijan State Statistical Committee (SSC) 2021). The overwhelming majority of Armenians identify as Christian of the Armenian Apostolic Church (Armenian Orthodox Church), whereas Azerbaijan's population is predominantly Shia Muslim. Armenia consists of 11 provinces (*marzer*), including the capital Yerevan. Azerbaijan was administratively divided into 10 economic regions (*İqtisadi rayons*), including the exclave of Nakhchivan, 66 districts (*rayons*) and 11 major cities (Figure 1.1) until 2021, when the government implemented an administrative territorial reform.[5]

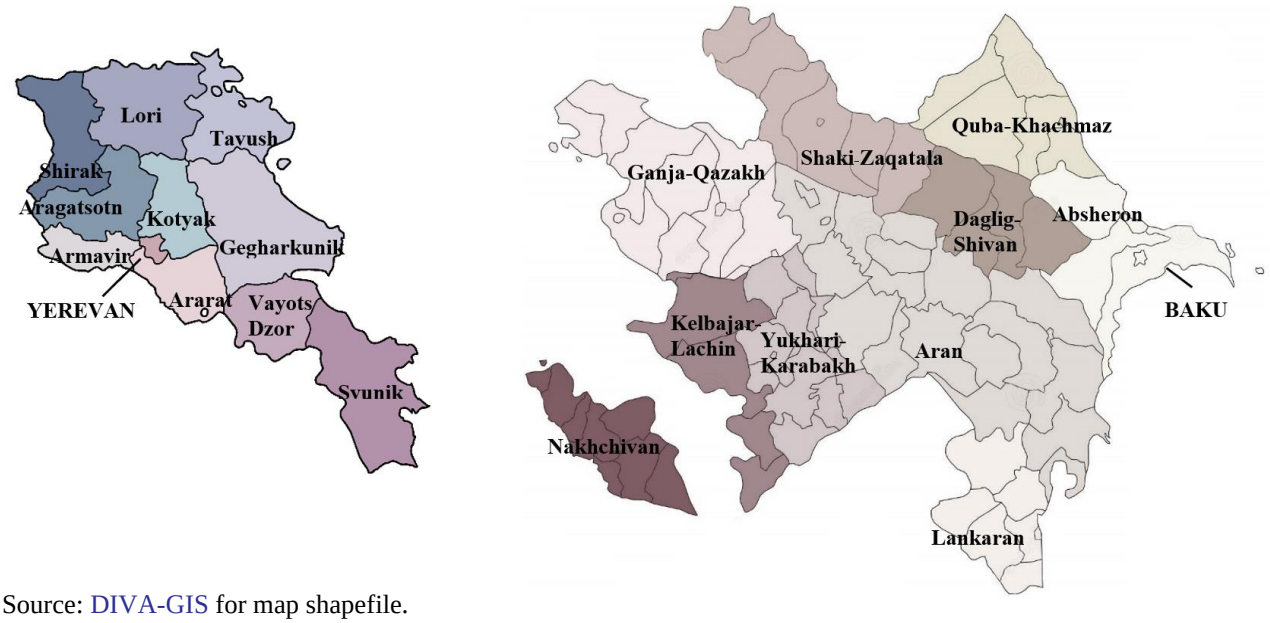
For long over history, despite their different ethno-religious identities, Armenians and Azerbaijanis intermingled and coexisted peacefully (de Wall 2019). Relationships began to deteriorate in the early 1920s when the Bolsheviks created the Nagorno-Karabakh Autonomous Oblast (NKAO). At that time, this mountainous, yet fertile region of 4.400 km^2 was part of the larger Karabakh province and was inhabited by about 125,300 people. Of these, 89% were ethnic Armenians (Table 1.1). Applying a 'divide and rule' policy, Stalin placed Karabakh's majority-Armenian population entirely within

[4] I attempted painstakingly to sort through the often conflicting, vague and relatively limited accounts of these neglected conflicts. The aim of this section is to reconstruct as objectively as possible the historical developments of the conflicts with available information from official sources and historical documents. In no way it seeks to compare human rights violations or atrocities committed by both warring forces, and it seeks to propose no particular position in the disputes.

[5] The territorial reform split the Aran region into three distinct regions (Central Aran, Mil-Mughan and Shirvan-Salyan) and Ganja-Qazakh into two regions (Gazakh-Tovuz and Ganja-Daskhkasan). It also gave the status of 'region' to the capital Baku and renamed the Kelbajar-Lachin region "Eastern Zangezur".

the Azerbaijan Soviet Socialist Republic (SSR) (still present-day Azerbaijan), with only a narrow strip of land populated by an Azerbaijani majority separating NKAO from the Armenian SSR. This decision generated Armenian discontent. At the same time, Stalin endowed NKAO with an autonomous status, which disappointed Azerbaijani authorities (Walker 1991). Although both parties manifested their discontent[6], no episodes of violence occurred for most of the Soviet era (Gamaghelyan 2010; Suny 1993).

Figure 1.1 Administrative divisions of Armenia (marzers) and Azerbaijan (İqtisadi rayons)



Source: DIVA-GIS for map shapefile.
In July 2021, the Kelbajar-Lachin region was renamed "Eastern Zangezur". The Aran and Ganja-Qazakh regions were divided into smaller regions as explained in the text.

Although there is disagreement on the exact start of the conflict, most analysts, official sources and international organisations indicate December 1991 as the beginning of the full-scale war, when Armenians in Karabakh declared independence (Broers 2016; Commission on Security and Cooperation in Europe (CSCE) 2012; Cornell 2001, 2015; de Wall 2014; Gamaghelyan 2010; Krüger 2010, Hopmann and Zartman 2010; Human Rights Watch (HRW) 1992, 1994; Huseynov 2010; International Crisis Group (ICG) 2005). The concurrent demise of the USSR and the following

[6] For example, between 1964-1965 Armenians in NKAO and in four neighbouring districts complained to both President Khrushchev and authorities in Yerevan about discriminatory acts from the Azerbaijan SSR government and asked for the unification of NKAO's with the Armenian SSR. The appeals received no follow-up.

independence of Armenia and Azerbaijan transformed the conflict from an intra-state to an inter-state war between Karabakhi-Armenian separatists supported by the Armenian government and forces of the Azerbaijan government.

Table 1.1 NKAO population by ethnic groups, 1926-1989

	Census 1926		**Census 1939**		**Census 1959**		**Census 1979**		**Census 1989**	
Ethnic group	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Armenian	111,694	89.1	132,800	88.0	110,053	84.4	123,076	75.9	145,450	76.9
Azerbaijani	12,592	10.0	14,053	9.3	17,995	13.8	37,264	23	40,688	21.5
Russian	598	0.5	3,174	2.1	1,790	1.4	1,265	0.8	1,922	1.0
Ukrainian	-	-	436	0.3	-	-	140	0.1	416	0.2
Other	416	0.3	374	0.2	568	0.4	436	0.3	609	0.3
TOTAL	125,300	100	150,837	100	130,406	100	162,181	100	189,085	100

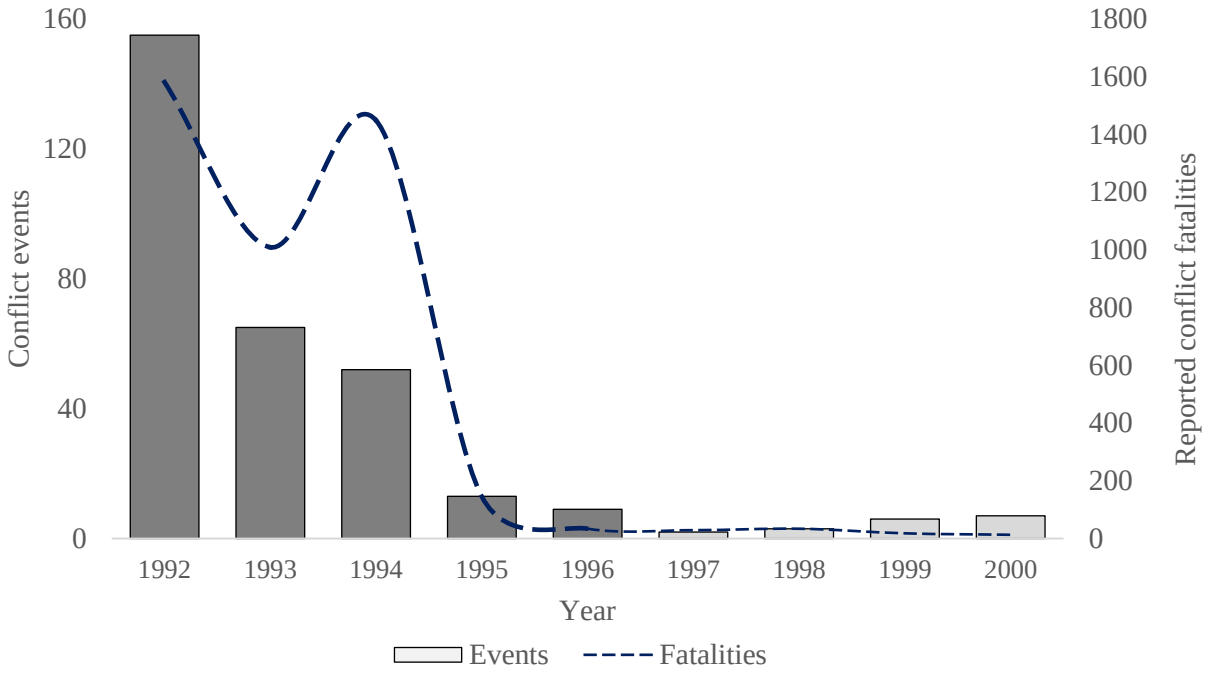
Source: Demoscope Weekly. USSR Population Statistical Collection. (2016).

The period 1992-1994 was the most violent both in terms of events and casualties (Figure 1.2). The highest number of violent acts, including the Armenian offensive on the Azerbaijani-populated town of Khojali (HRW 1992), was recorded in 1992.[7] Soon after, Armenians seized Shushi/Shusha (a key city in Karabakh), the Lachin district, and sections of other Azerbaijani districts around Karabakh (Cornell 1999). In May 1994, the warring parties signed a ceasefire that halted open fighting. Nevertheless, the years 1995-1996 were still characterised by considerable instability, attacks on civilians and conflict-related population movements (de Wall 2014; Gamaghelyan 2010). Since then and until the violent re-escalation that took place in September-November 2020, the conflict has been referred to as a classic example of a "frozen" conflict – a state of "no war-no peace", where open combat has virtually ceased, but official peace deal exists (Cornell 2017; Goltz 2015; Grant 2017).

The result of the conflict was the creation of a self-proclaimed entity – the Republic of Nagorno-Karabakh (also known as Artsakh) – which has since operated as an independent State but has not

[7] Note that this attack – which allegedly killed more than 450 Azerbaijani civilians in just a few hours – is still widely contested by the Armenian government. For detailed accounts, see Demirtepe and Laciner (2004) or de Wall (2014).

Figure 1.2 Yearly conflict events and fatalities, Azerbaijan 1992-2000



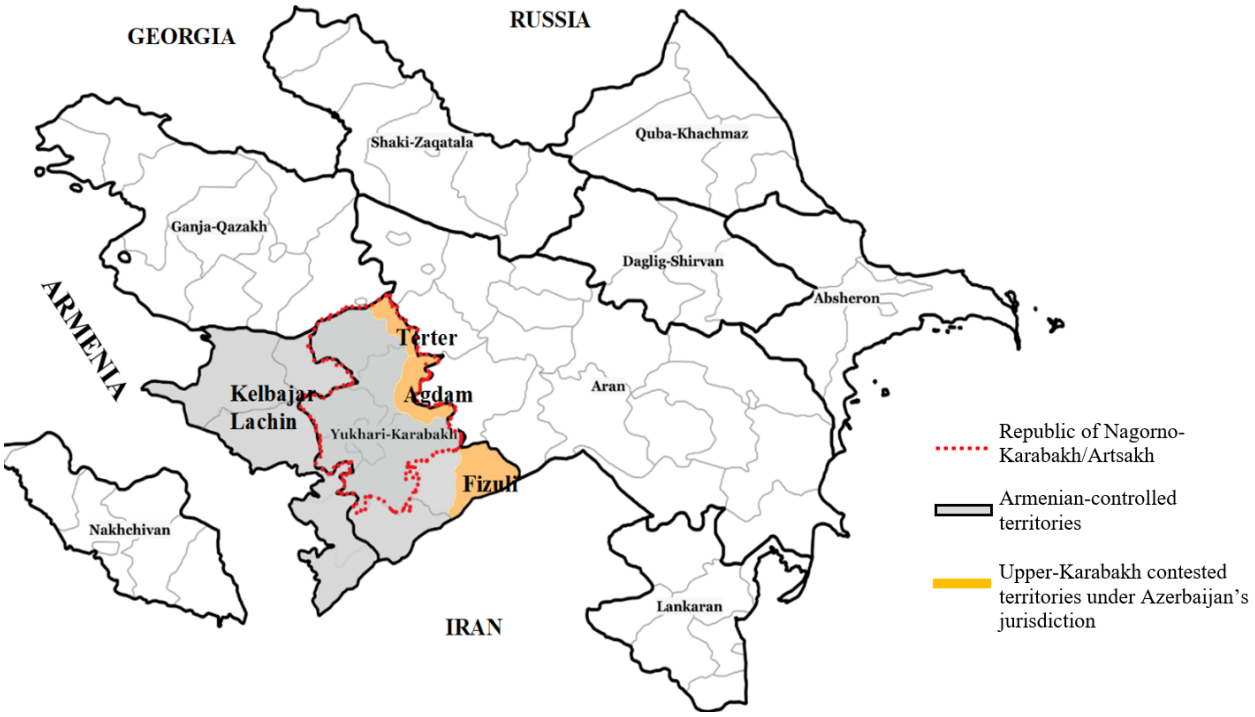
Source: UCDP-GED (2022). Notes: Darker bars and thicker dashed line highlight events and fatalities in core conflict years. The y-axis on the left-hand side refers to conflict events; the y-axis on the right-hand side to the number of reported fatalities. Fatalities as measured by UCDP-GED best-estimate.

been recognised by any other State, including Armenia. Together with the territories of the *de facto* Republic (Shushi/Shusha, Stepanakert/Khankendi, Martuni/Khojavend, Ivanyan/Khojaly)[8], ethnic Armenians gained full control and entirely populated the Kelbajar-Lachin region (today's Eastern Zangezur, i.e., the Kelbajar, Gubadly, Lachin, Zangilan districts), the Jabrail district, and the Western parts of Agdam, Fizuli and Terter. Altogether these territories comprise approximately 20% of Azerbaijan's internationally recognised territory (Racz 2016). Only the Eastern segments of Agdam, Fizuli and Terter in the Yukhari-Karabakh (Upper-Karabakh) region remained under Azerbaijan's jurisdiction (UN Security Council 1993a-d; Figure 1.3).

It is important to note that the Nagorno-Karabakh conflict presents a particularly complex case for the use of geographical and ethnic identifiers, as well as for the identification of territorial borders. The names given to the region, its adjacent areas as well as its inhabitants have been widely debated by the warring parties (see: Brown (1995) and Broers (2019) for comprehensive discussions).

[8] Note that names here are first provided with the Armenian terminology and then with Azeri names.

Figure 1.3 Spatial configuration of the territories after the 1994 armistice



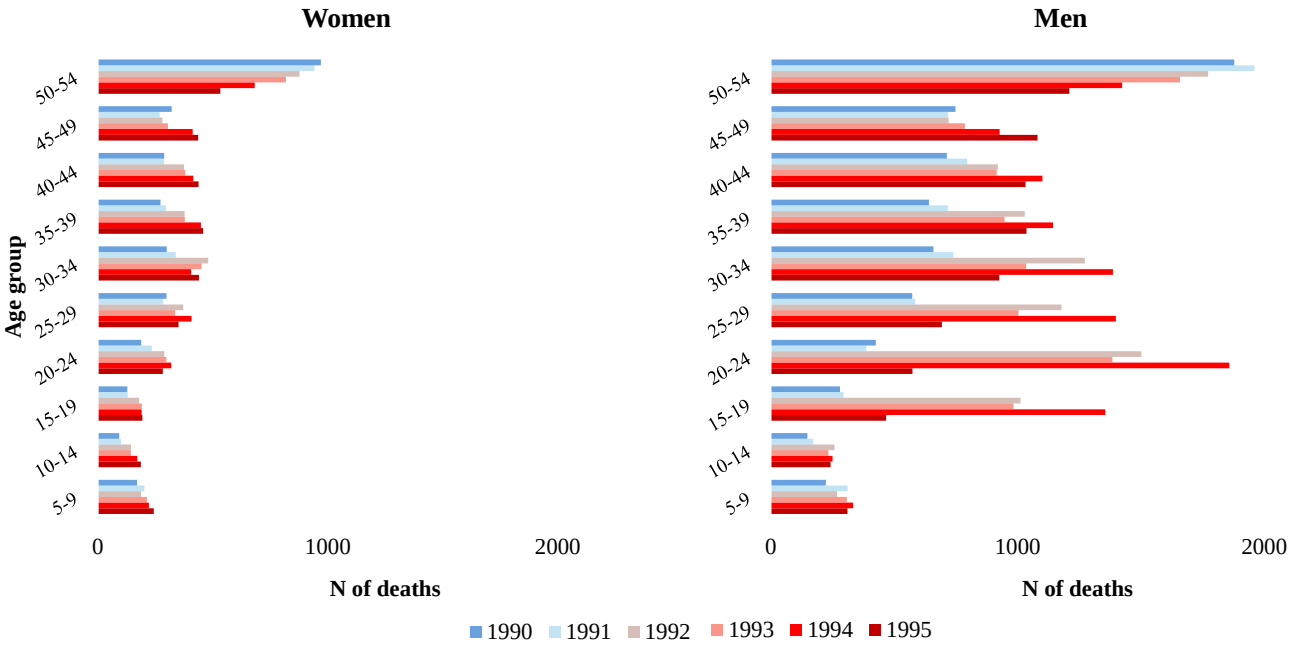
Source: DIVA-GIS for map shapefile.

Throughout this thesis, unless specified, I use the term "Nagorno-Karabakh" to refer to all the territories under the control of Armenian-supported separatists until the 2020 re-escalation. That is, the *de facto* Republic of Nagorno-Karabakh/Artsakh established in 1994 (red-dotted in Figure 1.3) and (in Azeri language) the districts of Shusha, Khankendi, Khojavend, Khojaly, and Jabrail, the Kelbajar-Lachin region and the Western parts of the districts of Agdam, Fizuli and Terter (in grey). I employ "Upper-Karabakh" to indicate the Eastern parts of Agdam, Fizuli and Terter, namely the contested territories that remained under the control of the Azerbaijani government (in orange). As for ethnic identifiers, I use the term "Azerbaijani" to refer to citizens (and/or soldiers) of the Republic of Azerbaijan[9], whereas "Karabakhi-Armenian" for the population and forces connected to the *de facto* Republic of Nagorno-Karabakh/Artsakh. When used with reference to the military, this term may include Armenian citizens, mercenaries and members of the armed forces of Armenia as it is not possible to differentiate them (Brown 1995).

[9] The adjective "Azeri" is only used to refer to the language spoken by Azerbaijani people.

The count of fatalities in the peak conflict period is hard to verify. No formally consolidated values exist either for civilian or military casualties. In official documents, Azerbaijan's government has generally been vague, speaking of "thousands" deaths and injured (e.g., Azerbaijan Supreme Court 2005). Most historical sources estimate that about 17-25,000 Azerbaijani lost their lives during the conflict (Cornell 2015; de Wall 2014; Yunusov 2002), with the Uppsala Conflict Data Program Geo-referenced Event Dataset (UCDP-GED) (2022) providing the most conservative figures (Figure 1.2). Despite little evidence on age and gender-specific mortality, the 2021 statistical yearbook of the Republic of Azerbaijan – which was the first to publicly publish mortality data before 2000 disaggregated by age and sex – suggests high mortality among combat-aged men in the core conflict years (Figure 1.4). Many other atrocities, including rape and torture, were perpetrated on both sides with women being the main target (Amnesty International 1993; HRW 1994).

Figure 1.4 Number of deaths by age and gender, Azerbaijan 1990-1995



Source: Azerbaijan SSC (2021).

The scale of forced displacement was immense: all ethnic Azerbaijani from Armenia and Nagorno-Karabakh had to flee their homes (Yunusov 2002). Although numbers are still contested, between 750,000 and 1 million Azerbaijanis were forcefully displaced across the territory of Azerbaijan (HRW

1994; UNHCR 2009).[10] Such a large flow of forced migrants – about 10 to 15% of the country's then total population of 8 million – generated vast social stress which endures today. For many years, Azerbaijan has been the country with the largest per capita number of internally displaced persons (IDPs) in its national population (Greenway 2009; Gureyeva-Aliyeva and Huseynov 2011). Although the last official IDP/refugee camp was closed in 2007, as late as 2016, one in 15 Azerbaijanis was still displaced (UNHCR 2017).

1.2.2 *Moldova and the Transnistrian conflict*

Moldova is an Eastern-European country bordering Ukraine to the East and Romania to the West. With a population of about 2.6 million, the country is officially divided into three macro-regions and two autonomous territorial units, Gagauzia and Transnistria (Figure 1.5). The latter, a strip of land situated on the Eastern side of the Dniester River, comprises 12% of Moldova's internationally recognised territory and is home to nearly 10% of Moldova's total population.

Besides physical borders, Moldova shares with Romania strong historical, cultural and social ties that are central to its conflict with breakaway Transnistria. Until the 1940 Molotov-Ribbentrop Treaty, the Moldovan territories west to the Dniester River were part of the so-called Bessarabia region of Greater Romania. As the Treaty was enforced, these lands were incorporated into the USSR and merged with Transnistria (which had been part of the USSR since the 1920s and home to a Slavic-speaking majority) to form the Moldova SSR. Since then and throughout Soviet rule, the Romanian-speaking majority was subject to an intense Russification process (Całus 2015; Williams 1999). Concurrently, Transnistria became the economic and political centre of the Moldova SSR and its Slavic-speaking elite developed strong connections with Moscow (Rogstad 2018).

[10] The nature of this conflict, with its contested borders, has inevitably generated disputed categories and definitions of the terms between the two belligerent parties. Nonetheless, the international community and Azerbaijan, as a signatory to the 1951 United Nations Convention relating to the Status of Refugees and its 1967 Protocol, refer to Azerbaijanis displaced from Nagorno-Karabakh as IDPs, given that they had not crossed an internationally recognised border. Ethnic Azerbaijanis forced to leave Nagorno-Karabakh or Armenia were recognised at their arrival in peaceful areas of Azerbaijan as *prima facie* IDPs and refugees, respectively (UNHCR 2003, 2009).

Figure 1.5 Administrative regions of Moldova and the separatist region of Transnistria

Source: DIVA-GIS for map shapefile.

As the USSR began to erode, Moldova's Western territories experienced a revival of their Romanian identity. This led to the creation of the nationalist movement Popular Front of Moldova. In 1989, authorities in the capital Chișinău enacted new language laws, which replaced Cyrillic script with the Latin alphabet and chose Romanian as the official language for "communication between nationalities" in the Moldovan SSR (Pasechnik 1989; Roper 2001). In June 1990, after the Popular Front won the elections, the country declared independence and the new government began talks of unification with Romania. The Slavic-speaking population of Transnistria firmly opposed these moves and, fearing marginalisation, launched a referendum for its independence. In September 1990 the region declared its secession and the creation of a separate Soviet republic. Because Transnistria was well-industrialised and located on strategic trade and communication routes, the decision provoked strong reactions from the Moldovan government, which culminated in the 1992 civil conflict (CSCE-OSCE 1993).

The conflict between Moldovan forces and Transnistrian soldiers (supported by Russian troops present in the region) remained highly localised near the Dniester River and was of short duration. Nevertheless, it claimed between 500-1,500 victims and more than 3,000 wounded (Dura 2010; Gorelova and Selari 2009). Intense fighting ceased when the Presidents of Moldova and the Russian Federation signed a bilateral agreement in Moscow. As in the case of Nagorno-Karabakh, this effectively "froze", but did not resolve the dispute (Kuznetsova 1992). The Transnistrian conflict left deep trenches of hostility, intolerance and distrust between Moldovans and Transnistrians, which have not healed until today. Although Transnistria has never been formally recognised by any country, including Russia, it currently exists as an "unrecognised state" with its own *de facto* authorities and government apparatus.

1.2.3 *Tajikistan's civil war*

Tajikistan is a Central Asian country landlocked between Uzbekistan, Kyrgyzstan, Afghanistan and the Chinese Xinjiang (Figure 1.6). Its 9 million population is geo-culturally split between a Tajik-speaking Sunni majority and an Ismaili/Pamiri minority primarily located in the Gorno-Badakshan region (Tajikistan SSC 2021).

Figure 1.6 Administrative divisions of Tajikistan

Source: DIVA-GIS for map shapefile.

At the time of independence in 1991, Tajikistan was the poorest of the former SSRs, and its economy was highly dependent on cotton monoculture and subsidies from Moscow (World Bank 2004; Falkingham 2000). With the Soviet collapse and the transition to a market-economy, Tajikistan's financial condition worsened dramatically, and its political landscape was soon characterised by an internecine struggle for power between clannish rival groups. In simple terms, the confrontation opposed forces of the old Communist leadership against a loose coalition of parties inspired by a mix of democratic and Islamist values and represented by the United Tajik Opposition (UTO). Affiliations to one group or the other were determined mainly by regional sub-divisions and by kinship lines (Heathershaw 2007). The post-Communist forces were primarily supported by clans in the Khatlon (formerly Kulob) and Sughd (today's Khodjand) regions, whereas Gharmi and Pamiri groups in the central Districts of Republican Subordination (DRS) and the Gorno-Badakshan Autonomous Oblast (GBAO) pledged allegiance to the UTO (Capisani 2000).[11]

The conflict started in 1992 and ended in 1997 with peace accords between the warring factions. As in the Nagorno-Karabakh and Transnistrian conflicts, violence in the Tajik civil war peaked in the earliest stages of the conflict (1992-1993) and its intensity varied greatly across geographic areas (Brown 2013; Kevlihan 2016; McLean and Greene 1998). Due to its remote location, GBAO suffered to a limited extent. Similarly, the geographical disconnectedness of the Sughd region protected it from violent clashes during most of the conflict. Conversely, the Khatlon region, the capital Dushanbe and the DRS were highly affected.

The human cost of the war was enormous. In its five years, the conflict killed between 50-100,000 people, in a country that at that time had approximately 5 million inhabitants (Atkin 1997; ICG 2001). Nearly 80,000 sought refuge outside the country, mainly in Afghanistan (Foroughi 2002), while 600,000 were displaced internally. Most IDPs returned to their home villages by the end of 1993 (Lynch 2002).

[11] See Atkin (1997), Nourzhanov (2005) and Walker (2006) for a detailed description of the Tajik conflict.

1.3 Data and methodological approach

I use various data sources and combine different measurements and quantitative empirical strategies to assess the consequences of armed conflict on family outcomes in post-Soviet countries, with a focus on Azerbaijan. This section describes the data challenges and methodological trade-offs inherent to the field of "conflict demography", those that arose while conducting the research, and explains resultant choices and practical empirical approaches.

1.3.1 *Data and measurement challenges in micro-level conflict research*

Data availability and quality, undoubtedly, represent the first challenge for researchers studying population processes in conflict zones. Data collection in insecure settings is a notoriously complex task (Mneimneh et al. 2008). Conflicts often occur where registration systems are weak; they hamper the proper functioning of existing surveillance infrastructures and can make governmental authorities unable or unwilling to collect population statistics (Obermayer et al. 2008). This means that the standard data sources used in peaceful contexts to examine family dynamics, like vital registration or census data, are typically not available, complete or reliable. When data collection is possible, it is usually performed on a small scale and targets specific groups, which raises concerns over representativeness (Axinn et al. 2012).[12] As a result, researchers interested in family outcomes and behaviours in conflict-affected populations often rely on qualitative approaches or resort to non-representative samples with the risk of high non-response and selectivity issues (Mourtada et al. 2017; Schlect et al. 2013; Sieverding et al. 2020).

Large-scale household survey data represent a suitable alternative to unavailable/faulty vital statistics or unrepresentative surveys (Brück et al. 2016). Although these data sources are usually collected by international development agencies and research institutes for purposes other than conflict research

[12] Some surveys have been recently implemented to study the consequences of conflict violence at the micro-level, e.g., the Nepal Peacebuilding Survey, the Colombian Longitudinal Survey, the Darfur Refugee Questionnaire. These data sources provide precious information for conflict research and allow to directly measure conflict exposure. However, they target specific sub-groups (e.g., displaced, former soldiers) or units of analysis (e.g., household heads, community leaders), preventing comparisons with the general (not-affected) population. Moreover, because of their high costs, these surveys do not collect relevant information to analyse family processes, e.g., birth histories. No survey of this kind (except the Life in Kyrgyzstan Survey, where though there has not been a full-blown conflict) exists for former Soviet countries.

per se, and sometimes long after conflict, they have some important advantages. First, institutional household surveys are easily accessible to researchers. This feature is particularly appealing when governments are unwilling to share post-conflict population statistics, like in the case of Azerbaijan. Second, data are gathered from sizeable and, generally, representative samples. Third, they can provide useful information to retrace family processes, e.g., retrospective birth and union records, metrics on critical dimensions of gender, and other micro-level variables that are not available in civil registries. Fourth, institutional survey data are less affected by changes in population composition and migration than vital registration, and can be helpful to assess some selection issues (Hugo et al. 2017).

Importantly, data from household surveys hold considerable potential to overcome the second major challenge faced by conflict researchers: the measurement of individual exposure to conflict (Brück et al. 2016). Household surveys in fact sometimes include either 'direct' or 'indirect' information that can be exploited to identify who, within a population, experienced conflict and, in some instances, the degree of exposure. Given the lack of consensus about definitions and how conflict should be operationalised at the micro-level, survey data offer the possibility to screen and weigh alternatives, and provide indications on the relative importance of different measures (Svallfors 2021a). Until recently, this potential has been seldom capitalised.

So far, family demographers using survey data have mostly relied on single measures of conflict exposure, typically 'indirect' variables. These include 'proxies' such as sibling/child deaths in conflict years (Jayaraman et al. 2009; Kraehnert et al. 2019), as well as relatively crude indicators, like geographical/time variables for cross-sectional comparisons between conflict-affected and non-affected regions/years or for pre-post comparisons of affected areas (Agadjanian and Prata 2002; Clifford et al. 2010; Woldemicael 2008). Although these strategies have been for long the main (and often only viable) way to capture or at least approximate the measurement of conflict exposure, each approach alone is prone to various biases, including issues related to omitted variables, interpretability and selection (Svallfors 2021a).

A more solid way to measure conflict at the individual-level is to take advantage of survey questions that directly ask respondents to report on whether/how conflict has affected them. Conflict-sensitive items of this kind asked by trained enumerators – and particularly those capturing easy-to-recall, tangible and (to the extent possible) less psychologically taxing conflict-events, like questions on war-related displacement status and/or dwelling damage[13] – allow the construction of indicators of conflict exposure based on the respondent's direct experience and reporting (Brück et al. 2016; Verwimp et al. 2020). Despite being low in cost and with few technical setbacks (e.g., erroneous recall), these sorts of questions are exceptionally rare in large socio-economic surveys.

A novel approach in the measurement of conflict exposure at the micro-level, that partially mitigates these lacunae, has come with the growing availability of geo-located conflict event datasets such as the Armed Conflict Location and Event Data Project (ACLED), B'Tselem, and the UCDP-GED. This strategy consists in linking the information on conflict violence (e.g., events and/or fatalities) collected in these geo-referenced datasets to survey respondents' location either by locality names (Shemyakina 2013), spatial join at a given administrative subdivision (Elveborg Lindskog 2016a; Svallfors 2021b) or by creating buffers of a given radius around conflict events or survey clusters (Bertoni et al. 2019; Østby et al. 2020). This technique has opened opportunities to create finer conflict indicators, immune from respondent bias and able to capture exposure in a relatively standardised format across settings. Yet, again, it is not without downsides. For example, this approach may be affected by measurement error due to underreporting of conflict events/casualties in conflict datasets and can introduce concerns over selective migration. Data linkage in itself can be challenging, especially when there are inconsistencies in the names/geo-coding of locations across datasets or spatial data are not (completely) available from both conflict data sources and surveys. The result is that even in studies relying on external geo-referenced conflict datasets, the measurement

[13] In conflict situations, it is hard to construct "harmless" survey questions as there is always the possibility of evoking traumatic memories in respondents. Brück et al. (2016) argue that survey items related to 'objective', 'group' and/or 'indirect' conflict events should help researchers to limit the risk of harming respondents whilst gathering essential information for later measurement.

of conflict exposure continues to vary.[14]

During the research process, I kept abreast with data availability and progress in the measurement of conflict, screening the merits and limits of different measurement strategies and, their relevance and applicability to the research contexts. A thorough inspection of available data and continual appraisal of how these could be best used for conflict measurement is core to this thesis and has become one of its methodological goals. I next explain the choices resulting from this iterative process.

1.3.2 *This thesis: data and measurement choices*

The main data sources used in this thesis are five large household surveys – namely the Demographic and Health Surveys (DHS) of Armenia (2015), Azerbaijan (2006), Moldova (2005) and Tajikistan (2012, 2017) – and external conflict information from the UCDP-GED.

The choice of survey data is first motivated by the limited availability and faulty quality of vital statistics in ex-Soviet Republics, particularly well-known in areas of Central Asia and the Caucasus (Anderson and Silver 1986). In Soviet times, civil registration systems were based on a complex balance of incentives, and their main purpose was to establish legal certification for Soviet citizenship more than to provide an accurate statistical record of population dynamics (Jones et al. 1987). Birth under-registration (especially of female births to evade legal requirements on school attendance and age at marriage), death under-count (particularly of infants) and delayed marriage registration (when occurring underage) were common issues, even before independence and the conflicts (Anderson and Silver 1985, 1986). The instability characterising the final years of the Soviet Union worsened the situation, to the point that, commenting on data from the last USSR Census of 1989, Anderson et al. (1994) wrote: "where in the Union there was civil unrest, it was impossible to obtain high-quality information about the population" (p.16). The reliability of vital registration continued to deteriorate as post-independence turmoil escalated into all-out conflict (Lutz et al. 1994). In Azerbaijan, for example, UNICEF (2003) estimated that about 7% of newborns and 10% of children aged between

[14] This pertains to both for the functional forms used to capture conflict exposure (e.g., continuous, categorical or dichotomous indicators) and the domains of conflict violence (e.g., conflict events, fatalities).

1-5 were not officially registered in the early 2000s. Severe under-registration of infant deaths was also documented, and evidence from indirect indicators (e.g., female schooling enrolment rates) suggests higher rates of early marriages than those reported in official statistics (UNFPA 2015). As mentioned earlier, for Azerbaijan, civil registration information predating 2000, disaggregated by age and sex, was not publicly available until 2021 and was not made accessible to me at the time of research. As for IPV, no official data was collected in Soviet Azerbaijan or other ex-Soviet Republics. After the USSR collapse, the reliability and relevance of data provided by State authorities in the countries of interest have been the cause of serious concern for the international community (World Organisation Against Torture 2004; UN Women (UNW) and WHO 2016; HRW 2019).[15] For all these reasons, vital statistics and official data are not the primary data sources for this research.

By contrast, DHS offer more reliable, representative and cross-country comparable sources of demographic and behavioural data in ex-Soviet countries affected by violence. The five selected DHS include fertility and marriage histories, and comparable modules on IPV. Importantly, they are all of good quality. I found no evidence of bias – including coverage, non-response and measurement errors, potentially linked to the conflicts – that may compromise their use. To demonstrate this, I briefly discuss the quality of the 2006 Azerbaijan DHS (AZ-DHS), which I use in all three studies.

To construct the sample, first residential dwellings, and then households, were identified using the sampling frame designed for the 1999 Population Census, i.e., the most up-to-date list of enumeration units compiled after the conflict. Because of this choice, the sample did not include the territories under Armenian control (i.e., the territories in grey in Figure 1.3), but sampled the partially contested districts in Upper-Karabakh (Agdam, Fizuli and Terter). This ensured the theoretical coverage of the target population (namely the *de facto* population living in the territories under the control of the Azerbaijani government). The actual identification of addresses provided in the sampling frame was overall successful: list frame imprecision – the rate of selected households that fieldworkers could

[15] Although there is some information on reasons for divorce and family homicide rates, which suggests that domestic and family violence was a widespread phenomenon even in the formally gender-equal context of the Soviet Union (Muravyeva 2014), the data is scarce and inadequate (i.e., very crude and not disaggregated by SSR or even year) for the purposes of this dissertation.

not identify because the address provided in the sampling frame was not a dwelling or because the dwelling was vacant or destroyed – was low (<2%), virtually identical for urban and rural areas and across regions, though Upper-Karabakh had unsurprisingly the lowest level of precision. Household and women participation was almost universal (97.8% and 97.6%, respectively) and there was little variation across regions and areas of residence, The lowest overall response rates were recorded in Absheron (91.3%) and Daglig-Shirvan (92.6%), the highest in Shaki Zaqatala (99.5%) and Baku (99.1%). Response rates in Upper-Karabakh were also reasonably high and in line with other regions (97.4% household; 97.1% women; 94.6% overall), as well as among female IDPs (98.8%) and refugees from Armenia (97.6%). This suggests that conflict did not induce non-contact and/or refusal. Finally, I found no sign of deliberate or unintended deviations from expected sex and age patterns in the sample. The total number of reported household members was 30,637. Women eligible to be interviewed (aged 15-49) represented 28% of all household members. For the most part, their distribution by 5-year age groups did not differ considerably from the 1999 census values. Women aged 25-39 were slightly underrepresented (15% of the sample of eligible women vs. 17% as per census estimate), likely because of differences in age structure between 1999 and 2006, and possibly greater non-response within this working-age group. Age information was complete for all respondents and evenly distributed across regions, and areas of residence, with no evidence of age heaping or displacement (e.g., Myers' blended index for the overall sample was lower than 3%, while Whipple's index value was around 100). Similar preliminary examinations were carried out for Armenia, Moldova and Tajikistan's surveys. I expand more on their quality in Chapter 4 and, in each study, I discuss other potential data issues related to the specific outcomes under consideration.

Aside from their overall good quality, the DHS offer a range of information that can be fruitfully and creatively combined with the UCDP-GED data to measure conflict exposure at the micro-level. As mentioned earlier, the UCDP-GED is an openly available dataset that records information from 1989 to present about episodes of conflict violence and provides (low-, best- and high-) estimates of resultant casualties, along with their spatial and chronological coordinates. In specific, a conflict event is defined as one in which at least one person was killed (Croicu and Sundberg 2016; Pettersson et al.

2021). Although like other conflict datasets the UCDP-GED comes with some limitations, it is an invaluable data source for conflict researchers and the only one covering the conflicts of the 1990s in ex-Soviet Republics. Among other important advantages, the dataset enables precise definitions of conflict exposure, the construction of measures capturing different dimensions and experiences of conflict (e.g., intensity and frequency), and it is widely used in related research, which can be helpful to compare, validate and generalise results (Backer et al. 2016).

For Armenia, Moldova and Tajikistan, information in the UCDP-GED can be merged with geo-referenced survey cluster data using spatial buffering to identify respondents located nearby conflict events (Østby et al. 2016). The AZ-DHS, instead, does not provide geospatial cluster data for confidentiality reasons. Therefore, when working with Azerbaijan data, I take a different approach, and leverage the rare conflict-sensitive questions asked in the survey to obtain sensible conflict indicators. In specific, I exploit direct questions on respondents' status of refugees from Armenia or of IDP, on their origin districts in Nagorno-Karabakh and on years lived in their survey-time location. I can employ the 'displacement' variable with few concerns for several reasons. First, the inter-state and ideological nature of the Nagorno-Karabakh conflict has been shown to have limited the stigma attached to IDP/refugee status disclosure (UNHCR 2009). Second, attitudes towards these groups in Azerbaijan have been generally positive to neutral (EGRIS 2018). Third, the IDP/refugee status was universally granted to all persons displaced by the conflict by the government of Azerbaijan (IOM 1997; UNHCR 2003, 2009, 2015). This group also represents about 10% of the AZ-DHS sample, in line with population estimates (Azerbaijan SSC 2011a). Even in the absence of geo-coded survey data, this set of information allows me to retrace the origin location of (displaced) respondents at the time of the conflict and, subsequently, to combine them with the UCDP-GED to screen and construct indicators of conflict exposure that best reflect respondents' characteristics. The data further offer the opportunity to compare differences between conflict-affected and non-affected respondents, and to explicitly examine differences between groups with diverse experiences of the conflict, such as forced migrants (i.e., all Azerbaijani survivors who were in Armenia and Nagorno-Karabakh territories before the war) and non-migrants in the contested districts of Upper-Karabakh.

The need to make creative use of the data and to apply a mix of indicators to measure armed conflict at the individual-level, as I do in this thesis, illustrates some of the data lacunae, insufficiencies and methodological obstacles demographic research on family outcomes in violent contexts still faces. Without doubts, the data sources and the measurement approaches that I use have some setbacks. I extensively and openly evaluate them in each Chapter, and offer reflections on future directions in the "Conclusion". Nevertheless, I believe this work demonstrates that there is still space for demographers to make use of existing data to construct credible conflict measures that address theory- and policy-relevant questions that would otherwise remain unanswered.

1.3.3 *This thesis: methodological approach*

To answer the research questions, I adopt a quantitative methods approach, combining standard demographic methods, regression techniques and research designs oriented to causal identification.

Classic demographic methods – like calculation of rates, analyses and decomposition techniques – are the first methodological component I use to obtain a general picture of the evolution of family processes in Azerbaijan and to explore my research questions. While description is sometimes undervalued or dismissed in other social sciences, good description is the building block of demography (Moffitt 2005): it serves to explore what is going on in the data, to confirm the existence and meaningfulness of the research problem of interest or to discover previously unknown patterns, especially when background knowledge is scant (de Vaus 2001; Kashyap 2021).

Good description invites exploratory work. I use regression techniques to dig deeper into how descriptive trends and patterns are related to individual characteristics and war exposure, net of confounding factors. In particular, I employ event history models with 'frailty' terms and linear regression models with fixed effects. In different ways, both statistical models permit assessing changes in the outcomes of interest associated with conflict, whilst taking into account unobserved factors (Steele 2008). For example, with event history models with 'frailty', I can harness the retrospective longitudinal nature of birth and marriage history data, while accounting for the potential selective impact of individual attributes that may be unobserved, either because the information is not

collected or because they are not measurable in principle (Jenkins 1995). Similarly, fixed effects in linear models purge the estimates from omitted factors common to respondents who, for example, belong to the same cohort or live in the same locality, and that may affect the outcome independent of conflict (Behrman and Weitzman 2016).

The goals of each study strictly guided the selection of statistical models. However, advances in the literature and the research skills I developed during my doctoral years have, admittedly, stimulated the choice of research designs. As I became a more mature researcher, the knowledge and training I acquired from fields other than demography have led me to think with increasingly greater care about claims of causal determination and to examine ways to integrate causal analysis in the research. Causal assessment in demography is though far from easy (Ní Bhrolcháinn 2001; Wunsch and Gourbin 2020), and arguably more so in situations where no clean/rigorous assignment to treatment is possible with conflict violence (Neal et al. 2016).

In this sense, recent demographic research has profited from the characteristics of some peculiar cases and multiple data points to mimic random assignment of conflict exposure and apply quasi-experimental techniques. In particular, the difference-in-difference (DID) methodology has gained prominence, and some studies have successfully taken advantage of pre-post conflict data and spatial variation in conflict violence to estimate the impact of war on family outcomes with such method (e.g., Elveborg Lindskog 2016a; Ekhator-Mobayode et al. 2022). Regretfully, it is not possible to apply the traditional pre-post DID approach in Azerbaijan or the other studied countries because of the lack of pre-conflict data for the outcomes of interest. However, the retrospective nature of the data allows exploiting variation in conflict exposure at the cohort level. This strategy is particularly compelling for the questions I ask in Chapters 3 and 4, where the focus is on conflict exposure before age 20. I take advantage of this well-defined age window to identify and compare women exposed to war before the end of their teens with their not-exposed peers, and older women.

Despite efforts to exploit the depth and breadth of available data, causal interpretation of the findings rests on several assumptions that it was not always feasible to address or examine comprehensively.

These include pre-conflict trend comparisons and endogeneity issues. To the degree that these assumptions are violated, my results represent and are to be interpreted as correlations. In each study, I perform a range of sensitivity checks to ensure the robustness of my findings in relation to their causal interpretation, as well as to study-specific issues and other caveats common to demographic research on conflict-affected populations. The final Chapter provides an overall evaluation of these methodological issues and draws some lessons for future research in the field.

1.4 Structure and contributions of the thesis

In addition to this Introduction and a concluding Chapter, this thesis consists of three empirical studies, designed to be read and understood independently.[16] Each study adds knowledge on the consequences of armed conflict for different aspects of the family domain. I first pay attention to fertility and marriage, and then to questions concerning family violence.

Chapter 2 focuses on the consequences of the Nagorno-Karabakh conflict on childbearing transitions in Azerbaijan. Using retrospective birth history data from the 2006 AZ-DHS, it provides the first detailed account of how fertility trends and patterns changed in the country since independence and in relation to the conflict with Armenia. I show that, while conflict exposure had little influence on aggregate fertility trends, it shaped differently the transition to different parities. In particular, exposure to war was associated with a higher risk of transitioning to the average parity level in the population, that in the Azerbaijani context is the second birth. The findings have important theoretical implications: by examining the hypothesis that the conflict-fertility nexus varies by parity, the study demonstrates that fertility responses to war need to be contextualised and analysed within the country's stage in the fertility transition and pre-existing norms around childbearing to be accurate.

Chapter 3 relies on marriage history data from the AZ-DHS to examine the consequences of the Nagorno-Karabakh conflict on early marital transitions of Azerbaijani women. In particular, this

[16] Although this structure inevitably led to some repetitions, it enabled me to preserve the integrity and coherence of the empirical studies. When necessary, I edited the Chapters to emphasise elements of relevance.

paper provides the first empirical test of the link between war and teen marriage. I exploit spatial variation in conflict violence and a cohort specification that accounts for the risk of marrying in teen ages before and during the conflict. I find suggestive evidence of lower levels of adolescent unions, especially for the cohorts who were in their early teens at conflict onset and who were thus for longer 'eligible' for teen marriage under conflict conditions. I show that conflict displacement may be a plausible driver for the observed results. Yet, I also find that conflict exposure only leads women to delay their marriages into their early 20s and that this postponement is associated with theoretically adverse union characteristics, including wider spousal educational and age gaps. The results contribute to the assessment of the consequences of war on the vulnerable group of girls and also provide insights into their long-term marriage characteristics. This opens questions about the extent to which young-age experiences of war shape women's long-term family and intimate relationships.

Chapter 4 explores one of these questions. In specific, it examines the legacy of experiencing conflict in developmental ages on women's later risk of IPV victimisation. In this study, I broaden the substantive research context to the four ex-Soviet countries of Armenia, Azerbaijan, Moldova, and Tajikistan, where the prevalence of domestic violence is worryingly high. Combining cross-national data on IPV from the DHS and geo-referenced information from the UCDP-GED, I compare the IPV outcomes of women who experienced conflict before the end of their teens with not-exposed peers and older women. I find that experiencing war at young ages – childhood in particular – is associated with a greater later risk of IPV. Among potential pathways, I find no association between young-age conflict exposure and attitudes towards IPV in women. By contrast, men exposed to war in late adolescence (16-19) show greater tolerance for violence against female partners. Further, I find that women's childhood exposure to conflict correlates with having a violent father. While other mechanisms did not explain the results or could not be examined because of data availability, these findings plausibly suggest that war can have both immediate and lasting consequences for intimate unions and family violence by normalising the use of violence in male perpetrators. This paper is the first to link empirically the two forms of violence with a long-term perspective. It adds to a better theoretical understanding of the cumulative nature of conflict-related vulnerability and further

contributes to the literature on the importance of early-life shocks for adult outcomes. Results are also policy-relevant: they call for greater attention to long-term outcomes and for integrating a focus on 'private' violence into strategies seeking to tackle GBV in conflict-affected zones.

Besides adding to knowledge on fertility, marriage, family relationships and gender outcomes of war, another goal of this thesis was to offer some methodological inputs to the study of the consequences of armed conflict on the family. As noted earlier, at the start of my doctorate, research on family processes in conflict was modest and relatively basic in its data usage and methodological approach. In the past few years, researchers have made considerable progress, using available data more efficiently and improving measures of conflict exposure. The present thesis is one of these endeavours. In each study, I show that it is possible to capitalise on already existing data sources and combine methodological tools to unravel the consequences of violent conflict on the family domain. Evidently, this requires a good degree of creativity and effort and is not free from limitations. Nevertheless, I believe that the combination of data, measurements and approaches used in this work can provide guidelines and suggestions to demographers and family researchers on how to make inferences on the impact of conflict with extant data. Importantly, I hope that this work can show that there are many research avenues and methodological opportunities to be taken in this field, even in the absence of 'perfect' information.

Finally, a word on my personal motivation to conduct this research. In 2014, amid the Syrian conflict, I worked in tented settlements for Syrian refugees in the Lebanese Beqaa Valley. There I met young girls, women and men whose lives had been tainted by the civil conflict. I learned their stories and their struggles. They became my friends. Despite the extremely challenging conditions they all had, and still have to endure, invitations to celebrate the arrival of newborns and the weddings of school-age girls and boys that I spent time with were frequent. Was that customary? Was that a choice they would have made if they had the opportunity to continue living in peaceful Syria? I did not know. At the same time, I learned that violence could easily flare up among camp residents, mostly within families. Was it all linked with the traumas and stress induced by the conflict? When I left Lebanon, I discovered that there was very little research that could answer my questions. It is thanks to my

Syrian friends that I pursued this path and with their encouragement, I decided to steer research attention to other areas beyond Syria that have been largely invisible in scholarly and everyday discourses. I hope this thesis can fruitfully add a piece to the puzzle by bringing to the fore some neglected populations and harsh violent conflicts that still affect the life chances of many girls and women, their well-being and families. I hope I can soon do the same, better, for Syria.

Without knowledge of how conflict affects the building block of human societies – the family – the real costs of war cannot be fully understood and tackled effectively. Adding evidence to a burgeoning research field, this dissertation provides indications to demographers and, hopefully, policy-makers wishing to comprehend the spectrum of costs involved with war. Today more than ever, I hope this research can serve to devise post-conflict strategies for comprehensive change in Azerbaijan and Armenia, whose populations are continuously on the brink of war, and be a starting point for future work in support of the women and people of Ukraine as they fight for freedom.

The work must continue.

Chapter 2

Armed conflict and the timing of childbearing in Azerbaijan*

2.1 Introduction

Armed conflicts represent one of the most important and recurring challenges facing human societies, with currently almost two billion people living in areas affected by violence and political instability worldwide (World Bank 2017). While some of the demographic consequences of conflict violence – mortality and forced migration in particular – receive substantial attention in population studies and considerable media coverage, there has been less research interest for the fertility effects of armed conflicts (Brunborg and Tabeau 2005; D'Aoust and Guha-Sapir 2010). This is of concern. First, in most societies, the family, its composition and functioning are still fundamental to individuals' perception of life quality and well-being (Alesina and Giuliano 2010; Pichler 2006). This centrality is especially true for those living in conditions of protracted physical, political, and economic insecurity, where the family represents the basic unit of subsistence and a key element in people's coping strategies (Justino 2011). Addressing how situations of violence and insecurity influence the

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family domain and household childbearing decisions is important to ensure and promote individual and community resilience. Second, lack of focus on fertility highlights gaps in our understanding of differences in vulnerability between women and men in conflict settings. Although men are typically more likely to be affected by conflict in terms of physical morbidity and mortality, women face other insidious challenges and often endure more heavily the burden of diminishing family resources (Ghobarah et al. 2003; McKay 1998; Plümper and Neumayer 2006). For instance, in times of crisis, impoverished households may prefer to interrupt the education of their young childless women to marry them as a way of reducing family financial "burden" and securing access to alternative means of sustenance (Shemyakina 2011, 2013). In contexts where childbearing is strongly tied to marriage, an acceleration in the timing of union formation is likely to encourage early childbearing (Khawaja and Randall 2006), a factor commonly associated with various negative health outcomes and educational and socio-economic disadvantage (Nour 2006; UNICEF 2005). Thus, examining the contribution of conflict to changes in fertility can shed light on the female condition and status in the household, and has implications for post-conflict development and gender equality. Third, knowledge of how fertility decisions are made during conflict would advance our theoretical understanding of the drivers of contemporary long-term population change. In turn, this could inform family planning, health, and education strategies in conflict-ridden and post-conflict settings where policy decisions, and often the institutions setting them, may have to be created from scratch.

Scarcity of research on the conflict-fertility nexus is particularly visible in the ex-Soviet space. This should not come as a surprise, as the USSR's dissolution is still widely regarded as a "uniquely peaceful geopolitical catastrophe" (Baev 2007: p.250). In reality, the demise of the Union created disaster zones where violence quickly emerged (Broers 2016). This is the case in Azerbaijan, a country located at the cross-roads of territorial struggles between the Persian, Ottoman and Russian empires, and which has been embroiled since 1991 in an inter-state war, now officially termed a "frozen conflict," with its neighbour Armenia over the Nagorno-Karabakh region. Furthermore, while several studies have investigated fertility changes in post-Soviet Central and Eastern Europe (Billingsley 2010; Kohler and Kohler 2002; Kotowska et al. 2008; Perelli-Harris 2005; Sobotka 2004;

Sobotka et al. 2003), and Central Asian republics (Agadjanian et al. 2008, 2013; Agadjanian and Makarova 2003; Clifford et al. 2010; Spoorenberg 2013, 2015), the fertility trajectories of countries in the South Caucasus remain largely undocumented. To date, no study has investigated the fertility dynamics of independent Azerbaijan and assessed the factors, including conflict, that might have contributed to changing fertility patterns in the early and late post-Soviet period.

The first aim of this paper is thus to complement and expand existing literature on post-Soviet fertility changes by retracing Azerbaijan's long-term fertility dynamics and describing the nature of their evolution, including aggregate, age- and parity-specific changes. A detailed reconstruction of these trends is required to determine the country's current stage in the fertility transition and to observe whether changes are related in time to conflict hostilities. The second objective is then to specifically address the questions of whether and how exposure to conflict violence was related to changes in fertility. In particular, the study employs birth history data from the 2006 Azerbaijan Demographic and Health Survey (AZ-DHS) and discrete-time survival models accounting for unobserved individual heterogeneity to explore the association between exposure to conflict and the transitions to first, second and third birth.

Theoretical expectations on the broad conflict-fertility relationship are ambiguous: individuals may accelerate the transition to childbearing to buffer future economic uncertainty, following the loss of a child or for other reasons like nationalist pro-natalist motives; alternatively, they may postpone births in hope of better times or because of trade-offs between child quantity and quality. Existing evidence is also inconclusive, possibly because different types of conflict and actors involved (e.g., inter-state versus intra-state violence) trigger different fertility responses (Neal et al. 2016). Additionally, extant research has so far mainly focused on aggregate trends, i.e., on whether conflict-exposed households increase or lower their fertility. This implicitly neglects the fact that the relationship between conflict and childbearing decisions is likely to differ by parity and be linked to the country's stage in the fertility transition.

This article, therefore, contributes to the theoretical debate by providing evidence from a neglected

conflict zone, where the interplay between ethnic and political drives as well as the emergence of nationalist ideologies against the external "enemy" might have translated into higher fertility among the conflict-exposed. Moreover, by looking at subsequent transitions, it adds to the literature by examining the hypothesis that the relationship between conflict violence and fertility decisions varies by parity. It shows then that conflict mainly influences the decision to transition to the average parity, here the second child.

Examining fertility responses to conflict violence is consequential for policymaking: for instance, evidence of higher fertility in conflict-affected households would require scaling up the resources for maternal and newborn health as well as family planning services devoted to such subgroups. Similarly, it may flag cohort-size effects which, if not addressed with prompt responses, might trigger additional social distress and frustration in already vulnerable groups, especially in the labour and marriage markets (Urdal 2006). Hence, the results of this study serve as inputs for the design of strategies targeting vulnerable populations such as refugees and internally displaced persons (IDPs) in Azerbaijan, as well as in other conflict-prone and conflict-affected areas with similar historical past, like the North Caucasus and Ukraine.

The remainder of the paper is organised as follows. First, I discuss the literature guiding the study – including theory on the conflict-fertility nexus and existing evidence on fertility changes in the post-Soviet space – and introduce the study context to inform my expectations about fertility changes and responses to conflict in Azerbaijan. Next, I describe the data and methodological strategies used in the analyses. I then present the results of trend analyses since independence and statistical models and discuss them with reference to Azerbaijan's institutional and historical context, population developments in the larger ex-Soviet sphere, and other conflict-torn settings. The policy implications of the findings and steps for future research output are also considered.

2.2 Background

2.2.1 *The conflict and fertility relationship*

As Randall argues, "[armed] conflict is part of the human condition and therefore should be integral

to all analyses and interpretation of demographic behaviour" (2005, p. 292). Although research on the demographic consequences of armed conflict has grown substantially, it still concentrates on direct effects, e.g., excess mortality, migration, and displacement.[1] The question of how conflict violence affects overall fertility has not attracted comparable attention, though its disproportionate long-term effects on women and the centrality of family support in unsettled times are well-known (Austin et al. 2008; Ghobarah et al. 2003; Patel et al. 2016). Empirical knowledge of its impacts on different birth orders is even thinner and has not yet been adequately articulated in theoretical discourses.

Most accounts of the relationship between conflict and fertility are historical studies of the consequences of World Wars I and II on Western European childbearing patterns. These typically document a "pro-cyclical" relationship, whereby wartime fertility drops are followed by post-war compensatory "baby booms" (Hobcraft 1996; Rindfuss and Sweet 2006). Experiences of conflict-related fertility declines have then been documented in some LMICs during the 1990s. In Central Asia, Clifford et al. (2010) noted period declines during the Tajik civil conflict. Yet, the authors contended that the drop was more the result of fallacious vital registration than of a real decline due to conflict. Lindstrom and Berhanu (1999) detected short-term declines in conceptions in Ethiopia during years of military unrest, with the caveat that this period also coincided with crop failures and drought, making it hard to disentangle the effect of each disruptive event. The Rwandan genocide was associated with the postponement of the first birth (Jayaraman et al. 2009) although only in the short-term (Kraehnert et al. 2019). Temporary declines were also observed in Cambodia (De Walque 2006), Angola (Agadjanian and Prata 2002), Eritrea (Woldemicael 2008) and Sarajevo during the Bosnian war (Hill 2004).

While most research suggests "disruptive" effects of conflict on fertility, some country-specific studies in the Middle East and sub-Saharan Africa and, more recently, Latin America provide evidence for the "fertility promotion" hypothesis (see for instance Abbasi-Shavazi et al. (2009) for

[1] For mortality, see for instance Tabeau and Bijak (2005) for Bosnia Herzegovina; Roberts et al. (2004) for Iraq; Spiegel and Salama (2000) for Kosovo. For migration; Singh et al. (2005) for Uganda and Sudan and Williams (2015) for Nepal.

Iran; Cetorelli (2014) for Iraq; Yucesahin and Ozgur (2008) for Kurdish populations in south-eastern Turkey; Khawaja and Randall (2006) for the Occupied Palestinian Territories; Kraehnert et al. (2019) for Rwanda, and Castro Torres and Urdinola (2019) for Colombia). A positive relationship is also documented at the macro-level. For instance, using time-series multi-country information for the 1970-2005 period, Urdal and Che (2013) identified higher aggregate fertility correlated with the presence of armed conflict in low-income countries. Nonetheless, although peaks and troughs in reproductive patterns in conflict settings seem to be common, other studies – whether cross-country (Iqbal 2010) or micro-level ones (Ladier-Fouladi and Hourcade 1997; Saxena et al. 2004) – found no association or fertility response to conflict violence.

Existing studies reveal the complexity of fertility responses to armed violence and point to distinct direct and indirect mechanisms eliciting them. With regard to direct effects, economic explanations based on the quantity-quality framework (Becker and Lewis 1973) suggest that conflict-induced hardship increases couples' awareness of the costs associated with each additional child, and highlight the advantages of having fewer mouths to feed, thereby leading to conscious efforts to delay or reduce childbearing. Similarly, spousal separation, population displacement and conscription can directly depress fertility (Hill 2004; Lindstrom and Berhanu 1999). By contrast, the "risk-insurance" approach to fertility suggests that, under conditions of generalised instability and economic dislocation, replacement fertility operates as a direct intentional coping strategy for households to preserve or increase their future sources of income and to compensate for the potential loss of already-born children (Verwimp and van Bavel 2005). Sexual violence, especially when used as a weapon of war, can also contribute to increases in the number of (unintended) births (Staveteig 2000).

Indirect mechanisms relate more to psychological and biological factors. For instance, conflict-induced stress and impairment can have unintended disruptive effects on fecundity and reduce the frequency of intercourse, thus lowering overall fertility (Palloni et al. 1996). By the same token, the detrimental consequences conflict has on community infrastructures, like roads, water systems, and health facilities can affect the organisation of food supply (Van Herp et al. 2003). Women's ensuing worsened nutritional status can then too have indirect disruptive effects on fertility. On the other side,

as the psychology literature and "attachment theory" propose, during periods of heightened stress, the need for emotional and physical support from loved ones may increase the frequency of intercourse and thus, indirectly, fertility (Cohan and Cole 2002). Childbearing may also be a way to "normalise" one's life in the face of traumatic events (Carta et al. 2012). Other indirect factors, e.g., the breakdown of community institutions, family planning services and disruption of health systems can also trigger fertility increases (Tabeau and Bijak 2005). Last, but important, in enduring inter-state confrontations, increasing nationalist rhetoric and the perceived need to maintain a demographic balance with the opposing group can culminate into pro-natalist feelings or even population policies encouraging childbearing (Abbasi-Shavazi et al. 2009; Fargues 2000).

Overall, such mixed evidence on the conflict-fertility relationship gives credence to Sillanpää's (2002) view that the demographic impact of armed conflicts varies according to the typology of the conflict, its severity and duration, and across population subgroups. Notably, when it comes to reproduction, this further suggests that differential responses are likely to emerge at different stages of the fertility transition and as a result of pre-existing norms around childbearing. The next sections provide background information on post-Soviet fertility changes to inform expectations on responses to conflict in Azerbaijan.

2.2.2 *Post-Soviet transitions and fertility changes*

To date, limited evidence on the conflict-fertility relationship has come from former Soviet countries and no study has assessed changes in fertility here that might have occurred in conjunction with inter-state armed violence, including the Nagorno-Karabakh conflict in Azerbaijan. More generally, fertility trends and patterns in post-independence Azerbaijan have been largely overlooked. By contrast, extended literature documented the fertility declines that came about following the collapse of the Soviet Union in countries of Central and Eastern Europe, in some Commonwealth Independent States (CIS) (Billingsley 2010; Kohler and Kohler 2002; Kotowska et al. 2008; Macura and MacDonald 2003; Perelli-Harris 2005; Sobotka 2004; Sobotka et al. 2003) and Central Asian republics (Agadjanian et al. 2008, 2013; Agadjanian and Makarova 2003; Clifford et al. 2010; Spoorenberg 2013, 2015). This body of literature showed that although the decline was a common

pattern across the entire ex-Soviet space, the nature of the changes differed by region.

In Central Europe,[2] where the economic and political transitions had been less traumatic, the decline resulted primarily from timing effects (Sobotka 2004); i.e., increasing mean age of first birth. This "starting-later" pattern has been attributed to ideational shifts favouring the adoption of "Western" reproductive and family models, including increased individualism and female autonomy (Kotowska et al. 2008; Rabusic 2001; Spéder 2006). Conversely, South-Eastern Europe,[3] Slavic CIS,[4] and Central Asian countries[5] faced wide social and structural problems which allegedly prevented such ideological shifts. Here, economic impoverishment and uncertainty triggered quantum effects and a "stopping-sooner" behaviour, leading to birth limitation at high parities and an increasing proportion of one-child families (Agadjanian et al. 2008; Clifford et al. 2010; Gjonca et al. 2008; Perelli-Harris 2005; Shakhotska 2011; Sobotka 2004; Spoorenberg 2009). The one study on a Caucasian country, Armenia, suggests some parallels with this latter type of response (Billingsley 2011).

2.2.3 *Post-Soviet Azerbaijan: socio-economic changes and the conflict with Armenia*

Azerbaijan's early transition period was tumultuous. Anomie, trade disruption and political dislocation led to the crumbling of the economy (Cornell 2017). In the 5 years between 1990 and 1995, hyperinflation caused recorded real wages to decline by 86% and per capita GDP bottomed at USD 173 (Singh and Laurila 2011). The loss of the Russian market – to which Azerbaijan exported much of its agricultural output, as well as reductions in subsidies, curtailed one of the country's most important employment sectors (World Bank 2005). All of this was accompanied by structural and institutionalised corruption, which already affected Azerbaijan during the Soviet era (Clark 1993). However, as opposed to other former constituent parts of the USSR, in Azerbaijan, a violent struggle for power and space further complicated the path to regime change. For its entire post-independence period, Azerbaijan has been at war with its neighbour Armenia over the Nagorno-Karabakh region, a landlocked territory internationally recognised as belonging to Azerbaijan (UNGA 2008; UN Security

[2] Croatia, Czech Republic, East Germany, Hungary, Poland, Slovenia and Slovakia.
[3] Bulgaria, Moldova and Romania.
[4] Russia, Belarus and Ukraine
[5] Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan.

Council 1993a-d), but which Yerevan claims to be an integral part of historical Armenian land (HRW 1994; Cornell 2001; Armenia Ministry of Foreign Affairs 2020).

The genesis of tensions between Azerbaijan and Armenia can be traced back to the late 1980s when officials of the then Soviet NKAO asked Moscow to be incorporated into the Armenian SSR (Broers 2016; Cornell 2015; HRW 1992, 1994). Pro-unification demonstrations in Armenia were held in Yerevan and the capital of NKAO Stepanakert (known as Khankendi in Azeri language), triggering the intervention of Soviet troops as well as waves of displacement on both sides. The early stages of the confrontation were characterised by several acts of violence, like the 1988 anti-Armenian retaliatory raids in Baku's industrial suburb of Sumgait, when many Azerbaijanis, including refugees who recently arrived from Armenia, attacked the homes of ethnic Armenian residents. The fighting caused 32 official deaths and forced Armenians to flee (HRW 1992; Cornell 2001; de Waal 2004).

Although disagreement exists on the exact start of the hostilities, most analysts and official sources indicate late 1991[6] as the beginning of the full-scale war and recognise 1992-1994 as the peak years of hostilities (Broers 2016; CSCE 2012; ICG 2005; Cornell 2001, 2015; de Waal 2004; Krüger 2010; Hopmann and Zartman 2010; HRW 1992, 1994; Huseynov 2010), when most conflict events occurred (Figure 2.1). The year 1992, in particular, was characterised by several acts of violence, including the Armenian offensive on the Azerbaijani-populated town of Khojali (ICG 2005; de Waal 2004; Goltz 2015; HRW 1992; Pope 1992; Lieven 1992). Armenians later seized Shusha, the major city of the Karabakh region, the neighbouring district of Lachin, and parts of other Azerbaijani districts adjacent to Nagorno-Karabakh.[7] In May 1994, the opposing parties signed an armistice agreement which led to the creation of a *de facto* Republic of Karabakh (known as the Republic of Artsakh). The years 1995-1996 were still characterised by considerable instability, attacks on civilians and conflict-related population movements (de Wall 2014; Gamaghelyan 2010). Since then, negotiations have stalled, and a number of ceasefire violations have been registered.

[6] In September 1991, the Nagorno-Karabakh enclave declared its independence from the Azerbaijani republic. Since then, the character of the conflict precipitously changed from a low-intensity conflict fought predominantly between private militias to a full-scale inter-state conflict (Human Rights Watch 1992; Zurcher 2007).

[7] These include the districts of Agdam, Fizuli, Gubadly, Kelbajar, Jabrail, Terter and Zangilan.

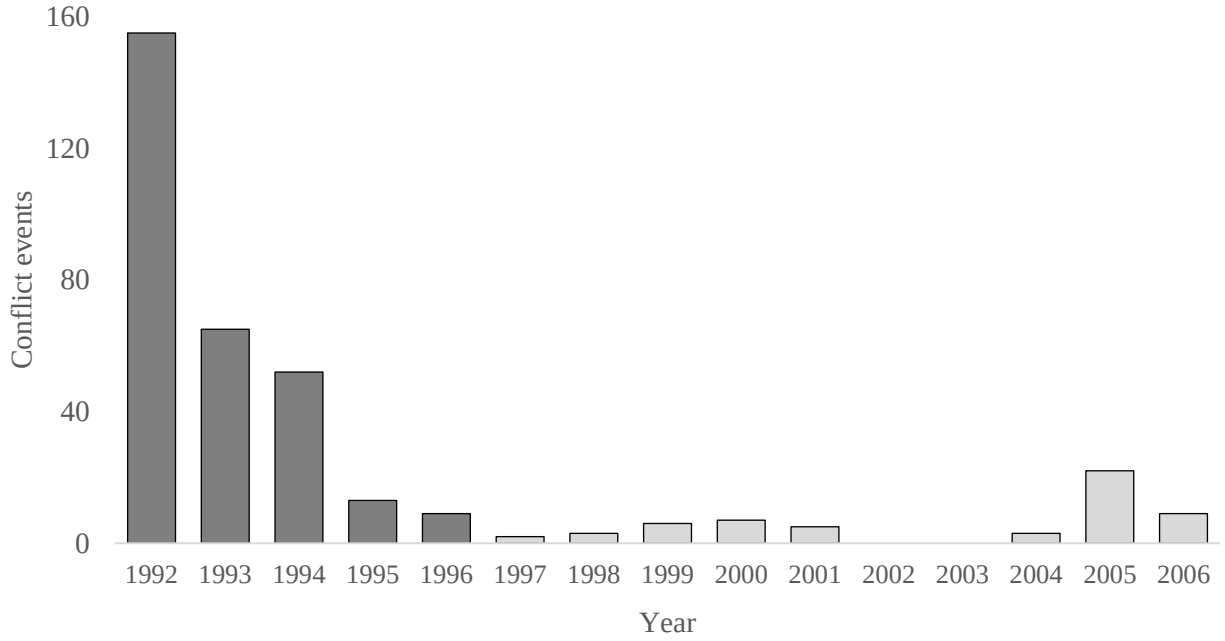
Although the count of fatalities is hard to verify, it has been estimated around 17-25,000 (CSCE 2017; Cornell 2015; de Waal 2004; HRW 1994; UCDP-GED 2022; Yunusov 2002). The scale of forced displacement was even larger. Between 750,000 and 1, 000,000 Azerbaijanis were uprooted from Nagorno-Karabakh or fled Armenia, sometimes under violent circumstances, and were displaced across the territory of Azerbaijan (Cornell 2015; de Waal 2004; HRW 1994; UNHCR 2009; Yunusov 2002).[8] Such a large flow of forced migrants – about 10 to 15% of the country's then total population of 8 million – generated vast social stress which endures today. For many years, Azerbaijan has been the country with the largest per capita number of IDPs in its national population (Greenway 2009; Gureyeva-Aliyeva and Huseynov 2011) and, although the last official refugee/IDP camp was closed in 2007, as late as 2016, one in 15 Azerbaijanis was still a refugee/IDP (UNHCR 2017).

Whilst the territorial dispute over Nagorno-Karabakh is often defined as a "frozen conflict" (Grant 2017: pp. 380–382), the sheer scale of suffering and scars it produced are still visible and periodic skirmishes continue to challenge the lives of both Armenian and Azerbaijani civilian populations. Recent years have seen a worrisome increasing trend in conflict incidents (Figure 2.1) as well as in the number of casualties (UCDP-GED 2022; U.S. Department of State 2016).[9] This highlights that similar unresolved security vacuums in the region are by no means frozen (Cornell 2015); rather, they continue to cause uncertainty and fuel nationalist sentiments, which might influence households' childbearing decisions.

[8] Forced migration in the Nagorno-Karabakh conflict featured both IDPs and refugees. The nature of this conflict, with its contested borders, has inevitably generated disputed categories and conceptual definitions of the terms and between the two belligerent parties. Nonetheless, the international community and Azerbaijan, as a signatory to the 1951 United Nations Convention relating to the Status of Refugees and its 1967 Protocol, refer to Azerbaijanis displaced from Karabakh as IDPs, given that they have not crossed an internationally recognised border. Ethnic Azerbaijanis forced to leave Armenia were recognised at their arrival in Azerbaijan as *prima facie* refugees (UNHCR 2003, 2009). This group was then granted naturalisation following the adoption of a Law on Citizenship in 1998, which though kept them eligible for the same benefits provided by the State to IDPs.

[9] An example of violent escalation occurred in April 2016 when hostilities broke out causing in just three days an estimated 150-350 deaths (UCDP-GED 2022; U.S. Department of State 2016). Skirmishes also took place in July 2020, followed by a fully-fledged war known as the II Karabakh War.

Figure 2.1 Yearly conflict events and fatalities, Azerbaijan 1991-2006 (DHS observation period)



Source: UCDP-GED (2022).
Note: Number of recorded conflict events. Darker bars highlight conflict events in the core conflict years. Note that UCDP-GED started to collect data on the Nagorno-Karabakh conflict in 1991 only. For this reason and, importantly, for consistency with official sources, deaths caused in earlier years are not included.

2.3 Data and measures

When official civil registries are flawed, as may be expected in conflict-affected countries, data from nationally representative surveys can be used to reconstruct fertility patterns, analyse their components, and test empirical associations between a wide range of variables (Cetorelli 2014; Clifford et al. 2010; Woldemicael 2008). In addition, surveys might be preferred in contexts where there is evidence of under-registration of births. As in other parts of the former USSR, underreporting, particularly of female births, occurred in Soviet Azerbaijan, due to registration depending on citizens' initiative, discrepancies in international/Soviet definitions of "live birth" and registration fees (Anderson and Silver 1989; Jones and Grupp 1987; Phillips et al. 2018).

For these reasons, the primary data source for this study is the Azerbaijan Demographic and Health Survey (AZ-DHS), implemented in Azerbaijan between July and November 2006. The survey

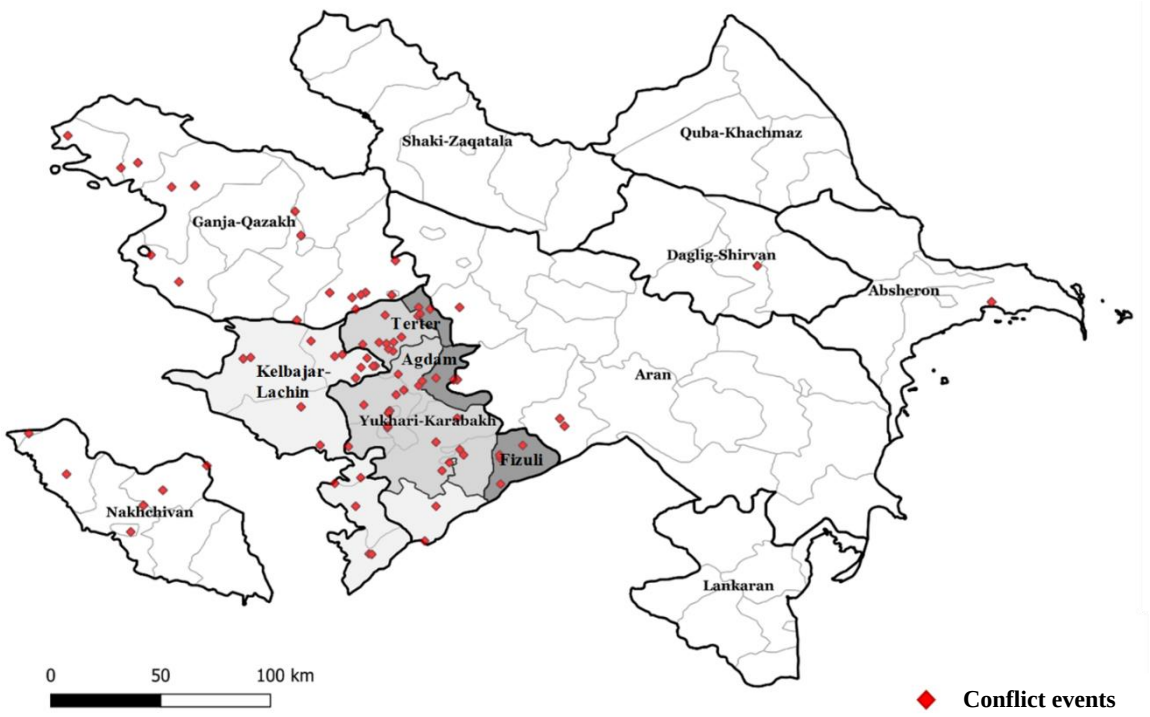
collected data on important indicators of social development, including fertility histories, health, and aspects of household welfare from a nationally representative sample of 8,444 women aged 15–49 years, with a nearly universal response rate. The survey sample was generated in two stages. First, clusters were selected in Baku and in the eight other economic administrative regions of the country from the 1999 Population Census sample frame. In the second stage, households were listed in each cluster and systematically selected.[10,11] It is important to note that, due to security reasons, the survey covered only selected areas of the contested Karabakh territories (i.e., the Eastern parts of Agdam, Fizuli and Terter districts, known as Upper-Karabakh) and did not include the Nakhichevan exclave and the Kelbajar and Lachin districts, the latter two being under the control of Armenian-backed separatist Republic of Artsakh. Figure 2.2, using geo-referenced data from the UCDP-GED (2022), shows the spatial distribution of violent events that occurred in the peak years of the conflict and soon after the 1994 armistice in relation to the sampling strategy of the 2006 AZ-DHS. Of the total conflict events that occurred between 1992 and 1996 (n=298)[12], the vast majority (about 81%) occurred in the sampled parts of Karabakh and the contested territories from which the entire ethnic Azerbaijani population was forced to flee. This, together with the fact that also all ethnic Azerbaijani left the districts of Lachin and Kelbajar during the war (ICG 2019) (according to the 2005 Census of the Republic of Artsakh, only ethnic Armenians – not the focus of this paper – have settled in these districts) should limit issues around sample selection bias and permits the correct identification of those exposed to violence.

[10] To ensure that the data are representative according to geographical population density and clustering, AZ-DHS provided sample weights were applied using Stata's `svyset` and related commands in all the estimations models.

[11] For more detailed information on sample selection, please refer to the official report by the Azerbaijan SSC and Macro International Inc. (2008).

[12] Note that I excluded from the map events (n=30) that had no specific location of occurrence or only provided general geographical coordinates for Azerbaijan.

Figure 2.2 Map of conflict events, Azerbaijan 1992–1996



Source: UCDP-GED (2022).

Note: The map shows the 9 economic regions of mainland Azerbaijan, and the exclave of Nakhchivan (non-sampled). The non-sampled Jabrail districts and Kelbajar-Lachin region are highlighted in light grey; the *de facto* Republic of Nagorno-Karabakh (Artsakh), and the sampled parts of the contested districts of Agdam, Terter and Fizuli (Upper-Karabakh) are respectively in progressively darker grey. Red diamonds conflict events. All conflict events in the non-sampled exclave of Nakhichevan occurred in 1992 and were coded by UCDP-GED as: "State-based violence between Side A: Government of Azerbaijan and Side B: Republic of Artsakh".

To determine changes in fertility associated with overall exposure to armed violence, it is necessary to identify the exposed. As the literature on conflict and violence highlights, exposure to conflict can take different forms (Kalyvas 2006; Balcells 2012). Experiences of armed violence can be direct and immediate (e.g., suffering physical aggression, being injured, experiencing house damage or disruption), and/or indirect and more chronic (e.g., geographical proximity to actual fighting/bombings, witnessing the death of loved ones and friends, being the relative of survivors). Although diverse, both types are likely to exert an influence on individual behaviour, including on fertility decisions (Curiel and Bishop 2018; Plümper and Neumayer 2006; Alsaba and Kapilashrami 2016). This understanding of conflict exposure forms the basis for how I operationalise its measurements in this paper.

A key feature of the AZ-DHS household questionnaire is that it asked all family members aged 16+ at interview time about their IDP or refugee status. If the individual self-defined as either refugee or IDP, he/she was then asked about his/her previous district or country of residence. This permits the identification of household members and women who have had direct experience of the conflict in Nagorno-Karabakh and who also experienced one of its ramifications; that is, forced displacement from the contested territories or migration from Armenia.[13] Further, the survey provides information on respondents' current place of residence and on the length of their stay in that location. I use this information to identify women who have "always" lived in sampled conflict-torn districts of Karabakh (Agdam, Terter, and Fizuli) or moved to these areas before the conflict erupted on a full scale. While these women did not experience conflict-induced displacement and, perhaps, might not have been as explicitly involved with disruption or killings (although Figure 2.2 shows that conflict events causing at least one casualty occurred all across the sampled part of Karabakh), they likely experienced recurring and more subtle conflict-related uncertainty (e.g., fear of coercive acts, land mines, land expropriation, or simply of warfare extending to their territories), precisely because of their residential proximity to the conflict line. It is again worth stressing the relevance of this differentiation as experiences of conflict violence and family-related decisions can be expected to vary between forced migrants and stayers. Moreover, including women who likely mainly had indirect experiences of violence is important as it allows attributing more confidently behavioural responses to other, more hidden aspects of violence, like uncertainty and fear, that reasonably have been experienced by a large subgroup of the population.

I exploit this valuable survey information to construct two different conflict exposure indicators based on a "narrow" and a "broad" definition of conflict exposure. The former defines as exposed to conflict

[13] I would like here to thank one of the reviewers of this paper in *Population and Development Review* who rightly pointed out that some of the refugees from Armenia came to Azerbaijan as a result of some planned village population exchange before the full war erupted (Huseynova and Rumyantsev 2010). There is, though, also evidence that refugee flows from Armenia to Azerbaijan (and vice versa) occurred during the key conflict years, following violent push and threats. In general, whether the relocation from Armenia occurred in a peaceful manner or as a result of direct violence, it still represents an indirect consequence of political tensions that likely impacted the lives of those concerned, including their decision to have children. For this reason and the basis of my conceptualisation of conflict exposure, refugees from Armenia are coded as exposed in all model specifications.

violence women who (i) always resided in Upper-Karabakh territories (or migrated there before the conflict erupted) and (ii) women who self-identified as refugees from Armenia/IDPs from Nagorno-Karabakh. The latter further includes (iii) women who were not refugees or IDPs, but whose husbands were. This is because family-size decision-making is the result of an interaction process between the individual preferences of each partner, and thus a choice jointly taken at the household level (Stein et al. 2014). Although women are the main agents and reporters of childbearing events, in a patriarchal society like that of Azerbaijan, limiting the measure to women's conflict status only may not fully capture the influence of conflict on fertility decision-making. Exposed women are then compared to not-exposed women, i.e., women who were not directly affected by violence from the Karabakh conflict or did not have indirect experience of it as they lived farther away from the conflict zone.

It is here worth mentioning that several studies addressing conflict effects on individual outcomes take advantage of the geo-referenced nature of many household surveys, and link them to subnational data on conflict violence from datasets like the UCDP-GED to create continuous indicators of conflict intensity (see for instance Østby (2016) or Elveborg Lindskog (2016) among others). Unfortunately, the AZ-DHS did not collect fine-grained geo-referenced cluster data that would allow similar measures. Even at a higher spatial scale, AZ-DHS data are not comprehensive enough to obtain precise matching. For instance, information on district of residence is not available for all women: whilst it is possible to trace back the origin district of IDPs before they fled Nagorno-Karabakh, the AZ-DHS only provides numerical information on the current district of residence of other women, including refugees from Armenia. This means that we know their economic region of residence (e.g., Yukhari Karabakh, Aran, Ganja Gazakh, Baku and so on), but not their specific district in that region.[14] The fact that the area size of these economic zones is substantially large[15]– together with the lack of full migration histories – makes super district-level linkage with conflict data hardly useful and prone to large measurement error. For these reasons, I opted for measures mainly based on

[14] It was not possible to obtain a list of the sampled district with names matching numerical codes due to confidentiality.
[15] For instance, the two other economic regions registering conflict events, Aran in Central Azerbaijan and Ganja-Qazakh (north-west), have respectively an area size of about 21.430 and 12.480 km^2. Linking conflict events at the region-level would inevitably and erroneously mask variation in conflict exposure within these large geographic units.

individual self-reported conflict status and geographical location only for those who never left the sampled conflict districts. Evidently, favouring a more conservative measurement over a more detailed one also reduces my capacity to distinguish women who, for instance, lived in the few conflict-affected districts in the economic region of Ganja Gazakh (North-West) bordering Nagorno-Karabakh from those who did not, but resided in the same region. Non-IDP/refugee women (as well as women whose husband was not affected by the conflict) in these regions are therefore all coded as not-exposed. Nonetheless, the fact that the vast majority of conflict events occurred in the sampled Karabakh districts should help to limit errors in the correct attribution of conflict exposure.

Table 2.1 presents the background characteristics of samples of ever-married women in Azerbaijan by conflict status used in the statistical analyses.[16] Despite the diverse experiences of violence, conflict-exposed and not-exposed women do not largely differ in their fertility-related characteristics. For instance, both groups report similar averages of children ever born (about 1.70 per woman), except those residing in the Upper-Karabakh region (1.88 children per woman). There is a difference in age at marriage across differently affected groups, with exposed women marrying slightly, but significantly later than not-exposed ones (21.30 vs. 22.01). No marked differences, by contrast, emerge across conflict groups in terms of age at first and subsequent births, although not-exposed women have children slightly earlier (but not significantly so) than their more exposed counterparts. The groups show more diverging socio-economic profiles. Conflict-exposed women are more urbanised than the not-exposed, IDPs and refugees especially. By contrast, residents in the Upper-Karabakh region are disproportionately more rural. This is expected, as according to official data collected around the time of and some after the implementation of the 2006 AZ-DHS, around 70% of IDPs and refugees in Azerbaijan resided in urban areas or peri-urban settings (World Bank 2010), where camps were more readily available and services for such population groups more easily accessible at the time of harsh conflict hostilities. The education differences among the groups are

[16] Note that Table 2.1 provides descriptive statistics for the sample used in statistical analyses, which is restricted to ever-married women aged 16+ at the time of the survey and exposed to the risk of first birth in calendar years 1992-2006 to avoid time-ordering issues related to conceptions and the onset of the conflict. In trend analyses, the sample was limited to women aged 16-39 in 2006 since individuals below age 16 were not asked the IDP/refugee status question. See the Methods section for more.

also noteworthy. While the least educated group is the Upper-Karabakh residents, the difference with the not-exposed is not large and IDP/refugees are the most educated. Nonetheless, differences are not statistically significant. Furthermore, the Soviet legacy of high literacy is visible across all subgroups, with only 2% of women in the overall sample reporting not completing primary schooling.

Taken alone, Table 2.1 suggests only modest conflict-related differences in socio-economic and fertility background. However, these numbers have limited informative power. The next section thus presents the methods and analytical strategies used to investigate more in detail fertility trends and their relationship with armed conflict in Azerbaijan.

2.4 Methods

The first aim of this study is to retrace Azerbaijan's fertility history and understand the mechanisms driving changes, e.g., whether they conform more to a "stopping-sooner" or a "starting-later" behaviour. Data from the AZ-DHS can be used to reconstruct annual fertility rates for the 15 years before the survey (Schoumaker 2013). For a woman aged x[17]in calendar year t, the fertility rate is:

$$F_{x,t} = \frac{B_{x,t}}{W_{x,t}}$$

where $B_{x,t}$ represents the number of births in year t to women aged x and $W_{x,t}$ is the exposure to the risk of giving birth at age x during year t calculated in women-years. Standard errors derived using the delta method, are then used to compute the 95% confidence intervals for $F_{x,t}$ (Pullum 2006; Schoumaker 2013). Yearly estimates of total fertility (TFR) are calculated for all women, for conflict-exposed and not-exposed women. I also compute total marital fertility rates (TMFR) for comparison.

[17] Given that data are truncated on older women, rates are here calculated for births and exposure of women aged 16-39. As in Azerbaijan most birth occur between ages 20-35, omitting the small fraction of births to women aged 40+ should be negligible. Calculated rates, thus, yield a conservative estimate of fertility over time

Table 2.1 Summary statistics of AZ-DHS weighted samples of ever-married women by conflict status

	Not-exposed	Exposed	Diff.	*p*-value	IDP/ refugee	Karabakh residents	Total
Residence type (%)							
Urban	53.27	61.36	8.09	0.154	72.32	11.77	54.38
Rural	46.73	38.64			27.68	88.23	45.62
Education (%)							
Secondary or less	70.97	66.91	4.06	0.542	66.11	70.51	70.41
Secondary special	15.98	19.63	-3.65		19.95	18.95	16.48
Higher	13.05	13.46	-0.41		13.94	11.94	13.10
Age (mean, years)	28.72	28.94	-0.22	0.612	28.81	29.51	28.75
Age at marriage (mean, years)	21.30	22.01	-0.71	0.038	21.94	22.30	21.40
Age at first birth (mean, years)	22.35	22.88	-0.53	0.067	22.77	23.38	22.43
Age at second birth (mean, years)	24.84	24.98	-0.14	0.372	25.01	24.83	24.86
Age at third birth (mean, years)	27.21	27.68	-0.47	0.438	27.91	27.01	27.26
Children ever born (mean)	1.70	1.69	0.01	0.908	1.65	1.88	1.70
First child died in conflict years (%)	1.33	1.76	-0.43	0.624	2.00	0.62	1.39
Second child died in conflict years (%)	1.63	2.82	-1.19	0.525	2.78	2.88	1.77
Percentage in sample	82.41	17.59			8.89	8.70	100

Source: 2006 AZ-DHS. Note: Exposed women are defined using the "broad" definition of conflict exposure. The IDP/refugee sample includes women who did not live in the Karabakh region at the time of the survey, but who (i) self-identified as IDP/refugee in the survey or (ii) whose husbands did. Karabakh residents include women who never migrated from the Karabakh region. The sample is restricted to women exposed to the risk of first birth in calendar years 1992–2006. *p*-values are reported for tests of difference in means or proportions.

Next, to understand the nature of fertility changes, I calculate period parity-specific changes using parity progression ratios (PPRs). This measure presents the proportion of women who have *j* child in the years preceding the index year and go on (or "progress") to have *j*+1 child(ren) in the index year (Hinde 1998). PPRs are constructed using the synthetic cohort method (SCM) (Ni Bhrolchàin 1987).[18] The risk of selection due to censoring inherent to the SCM is here minimised as changes in this incremental aspect of childbearing are explored over a relatively limited time frame – i.e., 1991-2005.

The second aim of the paper is to investigate how conflict exposure may be associated with changes in fertility, and in particular with the transition to the first, second and third birth. To do so, I use an event-history approach which allows establishing general and conflict-specific trends in the outcomes of interest over time. Specifically, the model chosen to analyse the three transitions is a discrete-time logit model accounting for unobserved heterogeneity ('frailty') at the woman-level (Allison 1982). In its general form, the model can be expressed as:

$$log\left(\frac{\pi_{t,i}}{1 - \pi_{t,i}}\right) = \alpha D_{t,i} + \beta X_i + \gamma P_{t,i} + \upsilon_i$$

where, $\pi_{t,i}$ is the probability for woman i of experiencing the event during interval t, provided that she has not yet experienced it. $D_{t,i}$ is a vector of functions of the cumulative duration by interval t with coefficients α. This is specified by breaking the hazard function into k categories (e.g., <2 years, 3-6 years and so on) during which the risk of the outcome of interest is assumed constant for women with the same pattern of covariates. The duration categories were chosen to best describe the shape of the baseline hazard which changes quickly at the beginning of the interval (e.g., after marriage in the case

[18] The synthetic cohort method allows calculating PPRs in the following way:

$$a_j = 1 - (1 - q0)(1 - q1)(1 - q2)\ldots(1 - q10)$$

where a_j is the period progression from the j^{th} birth to the $(j+1)^{th}$. Accordingly, a_0 represents progression from zero to one child, a_1 from one to two children and so on. The set of proportions qx are calculated, as Hinde (1998) suggests, so that the numerator is given by the number of women who had j^{th} birth in year *t* prior to the current year and had their $(j+1)^{th}$ birth in the current year. The denominator is then given by the difference between the total number of women who had a j^{th} birth in the year *t* prior to the current year and those, among them, who already had $(j+1)^{th}$ birth before the start of the current year *t*.

of the transition to the first birth) and then diminishes less rapidly. Time is measured in years, as common in fertility analyses. The choice of this time scale (years instead of months) is also guided by the fact that interest lies in the impact of macro-level political changes which, even in rapidly-transforming conflict settings like independent Azerbaijan, unfold gradually over time (Agadjanian et al. 2008). X_i is a set of time-invariant individual-level covariates with coefficients β and $P_{t,i}$ is a vector of dummy variables representing calendar year effects. These are time-varying since women are exposed differently to historical periods as they move forward through the risk of giving birth. To avoid any time-ordering problem and more accurately test whether conflict exposure was associated with fertility outcomes, analyses start in calendar year 1992. This allows taking into account the gestation period for births conceived in the earliest phases of the conflict and making sure that births that happened before the conflict broke out do not affect the estimates.[19]

The main predictors of interest are thus calendar year and the conflict exposure variable (in its "broad" definition, as interest lies not just in the woman's experience, but that of the household as a whole as explained above), as well as the interaction between the two. For second and third birth, I also include a variable capturing the relation with experience of child death during key conflict years (1992-1996) as a way to explore the replacement mechanism. This latter predictor is coded as a dummy variable where 1 indicates that the previous child died during conflict years and before the birth of the i^{th} child under study to ensure that the events are in the correct chronological order. Other variables included in the Xi vector are age at marriage specified as linear and quadratic (age at second and third birth for following births), residence type (urban or rural), and education. This latter is constructed as a 3-level variable, following Agadjanian et al. (2008) and reflecting the Soviet education system: general secondary or lower; vocational, alternatively known as specialised secondary (*tekhnikum* in Russian), and higher. In the second and third birth models, I further add sex of the previous child(/ren) to account for possible sex-selective practices, which are known to be widespread in Azerbaijan (Meslé et al. 2005; Yüksel-Kaptanoglu et al. 2014). Models are estimated for the sample of all women as

[19] Note that models considering all calendar years (i.e., 1980-2005) were also estimated. Results did not change qualitatively in terms of significance and size for the conflict variables of interest.

well as for subsamples of women exposed or not-exposed to violence to examine if the relationship with certain covariates, e.g., child death, varied within groups with different exposure to the conflict.

Lastly, υ_i represents the woman-specific "frailty" term which accounts for unobserved heterogeneity attributable to individual time-invariant unknown risk factors. For each individual, υi represents a set of unmeasured characteristics randomly drawn from a normal distribution with variance σ^2_υ (Steele 2008).[20] This is interpreted as the residual variance between women that is due to unmeasured time-invariant attributes. Including woman-specific unobserved individual heterogeneity in the study of transitions to the i^{th} birth is important because omitting some unobservable variables[21] or simply ignoring the heterogeneity existing in women's biological capacity of conceiving, can lead to a dynamic selection process that may produce incorrect hazard estimates and a misleading estimation of duration dependence (Jenkins 1995). In the case of transitions to the next birth, this is because women have different childbearing intensities: those with high intensities (i.e., those whose unobserved characteristics make them at "high-risk") have shorter durations and are selected out of the sample, leaving those with low intensities ("low-risk") behind. This in turn implies that at higher duration, the sample at risk is increasingly composed of women whose unobservable characteristics make them unlikely to experience the event of interest and thus more "robust" against childbearing than the rest. Unobserved heterogeneity is therefore included to avoid the emergence of such model specification issues.

Given that childbearing outside wedlock is particularly rare in Azerbaijan and that most women marry by their early 20s, women aged 16+[22] are observed from their date of marriage until the date of first

[20] Alternatively, a gamma distribution can be used to model random effects accounting for unobserved heterogeneity (Larsen and Vaupel 1993). Yet, this is more commonly used when time is considered as continuous. In discrete-time settings, 'frailty' terms are typically assumed to be normally distributed (Steele 2008).

[21] Examples of these can be the frequency and time of intercourse, women's work status and educational level at each time point, normative barriers associated with childlessness, the thoroughness of the search for a suitable mate. In the case of conflict violence, these covariates are likely to be important as, for instance, conflict is likely to modify one's search in the marriage market (Shemyakina 2013), increase coital frequency in settings where war rapes become widespread, or reduce it due to male conscription or if violence generates large-scale migration (Buvinic et al. 2013).

[22] Recall that women aged 15 years old at the time of the survey were not asked information on their IDP/refugee status and thus were excluded from the analyses. Only 1 observation had to be dropped accordingly.

birth or interview for the first transition[23], whichever comes first. Those who gave birth before entering into official union are thus excluded from the analyses (0.80%, n=43). For second and third births, exposure starts 7 months after the previous birth to allow for the effects of lactational amenorrhoea.[24] Women who have not experienced these events at interview time are right-censored.

As robustness checks, the paper also explores differences in the transition to birth by using the "narrow" definition of conflict and by separating out the relationships for refugees/IDPs and Karabakh residents. Finally, it is important to note that all the estimates reported in this paper are based on a sample of survivors residing in Azerbaijan in 2006. Those who died during the conflict or migrated outside the country are therefore excluded. Most of the movements of the ethnic Azerbaijani ("titular") population occurring during conflict years were internal to Azerbaijan, predominantly in the form of displacement. International migration concerned more the emigration of Russians in the post-independence years and of Armenians (Aliyev 2006). Hence, as interest lies in the titular population, outward migration should not represent a major issue.

2.5 Retracing fertility trends in post-independence Azerbaijan

Figure 2.3 displays trends in TFR for all women in Azerbaijan from independence to 2005 as estimated from the AZ-DHS and compared with official estimates from vital registration[25] and fertility estimates as compiled by the Human Fertility Collection (HFC) ODE database[26] (MPIDR and VID 2018). In general, sources provide considerable evidence of period fertility decline since

[23] Models estimating the odds of conception in a given year since marriage (first or second birth) were also estimated by lagging the date of birth of the child back of 9 months. I prefer to report models for the odds of giving birth as conflict exposure may not only correlated with conception, but also with its realisation in a live birth. Nonetheless, results were largely similar.

[24] According to the AZ-DHS, the average number of months spent breastfeeding for the first and second birth in Azerbaijan is 7.5.

[25] Note that official registration data on age-specific fertility rates from TransMonEE (2018) for Azerbaijan are available for age 5-years age groups from age 20 to age 35 only precluding calculation of the TFR 15–39 for direct comparison with the survey estimate. Hence, TransMonEE estimates are here reported for women aged 15–49.

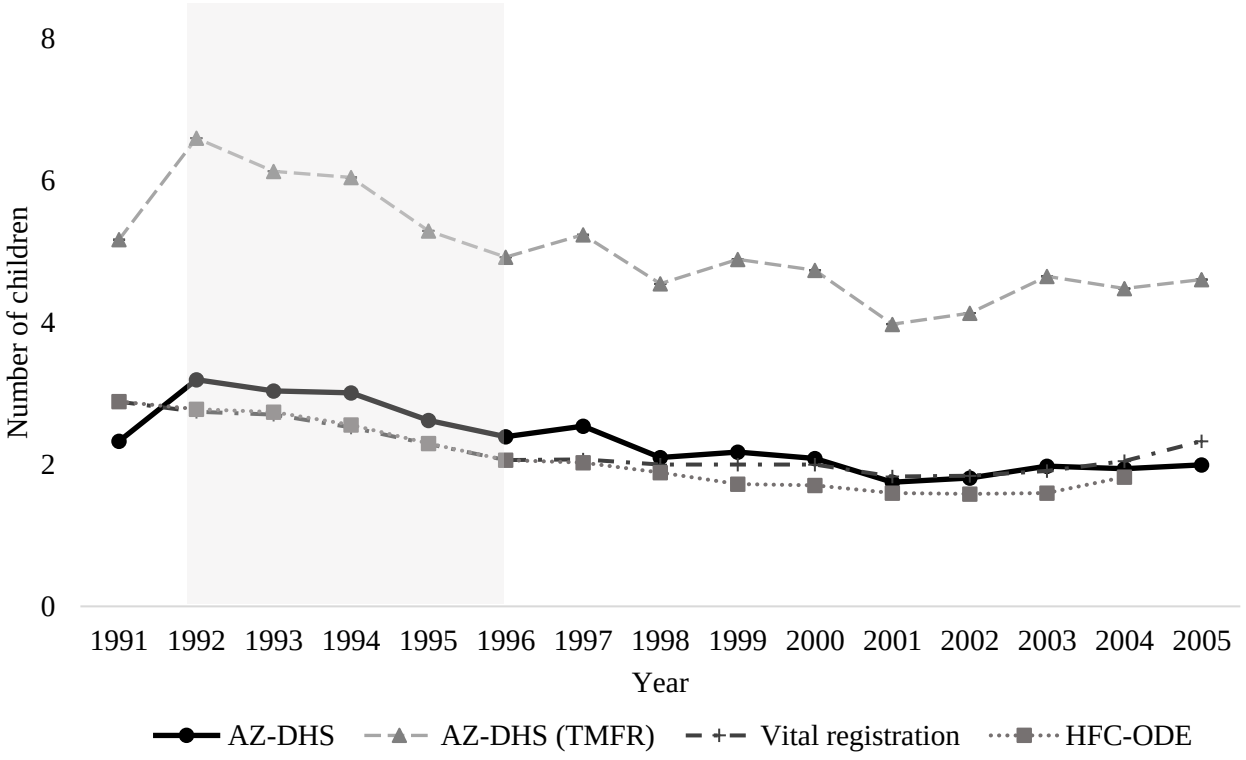
[26] The ODE database was developed by the Institut national d'etudes démographiques (INED) and its methodology permits to calculate annual TFR using available data on the total number of live births and the age structure of female population in a year. For more information on the ODE methodology, refer to ODE et al. (2002).

independence in 1991, although vital registration and survey estimates converge only at the start of the new century, suggesting under-registration of birth in the post-independence and conflict years. A small, but noteworthy, opposite mismatch between these two sources appears in the last years of observation, with the latter reporting higher fertility than survey estimates. This could be due to increased fertility rates in women aged 35–49, whose fertility is only partially captured by estimates calculated retrospectively from the AZ-DHS (see Figure 2.6), between 2003 and 2005.[27] The somewhat lower estimates provided by the HFC-ODE database for the first part of the new century are likely to be the result of the methodology used to calculate such rates. Despite these small differences, sources follow a similar trend.

Overall, the number of children per woman moved from above 3 in 1992 (as estimated from the AZ-DHS) to below replacement at the start of the new century (1.75 in 2001, 95% CI 1.56–1.93) with then TFR plateauing at around 2 children per woman in the most recent observation years. The declining trend in TFR of the 1990s is visibly mirrored in annual estimates of TMFR (Figure 2.3). In the post-independence years and at least until the start of the new century, period marital fertility rates almost halved, closely following the behaviour of overall fertility. In general, the decline is most evident between 1992–1996, reflecting lower conceptions during years marked by conflict and economic downturn. With the start of the new millennium marital fertility experienced a larger increase than TFR, but then similarly stabilised at around 4.5 children per married woman towards the end of the observation period.

[27] Vital registration data from the TransMonEE database show that age-specific fertility rates for women aged 35–49 were 8.89 in 2003, 10.38 in 2004 and 10.08 in 2005. A rising trend which might explain the small mismatch between survey and vital registration estimates.

Figure 2.3 Total fertility rate and total marital fertility rate, Azerbaijan 1991–2005



Source: TransMonEE vital registration data (women aged 15–49), Human Fertility Collection (ODE Collection) and 2006 AZ-DHS (women aged 16–39). Note: Shaded area highlights key conflict years.

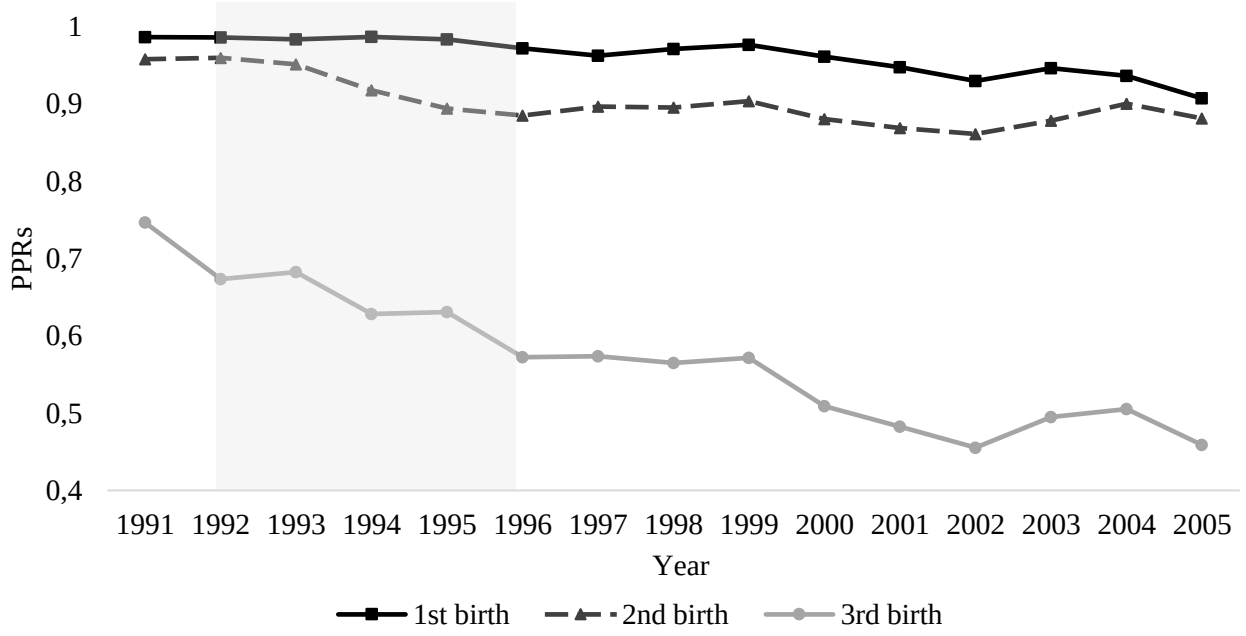
PPRs, presented in Figure 2.4 using 3-year moving averages to smooth annual fluctuations, show that the drop in fertility was primarily the result of declines in third-order fertility and, only a decade after the fall of the USSR and onset of the Karabakh conflict, to delayed first birth. In detail, the proportion of women who moved from having no to one child after marriage remained practically unchanged during the conflict period and only showed a declining tendency at the beginning of the new century. Similarly, the proportion of women who continued to have a second birth remained more or less constant over the 1990s and early 2000s, except for some decline during conflict-years. Third order progression instead was characterised by a more substantial drop: the proportion of women transitioning to the third parity almost halved between the early independence years and 2005. Falls occurred in all years, although most of the decline in progression to the third birth can be observed from 1992 to 1996 (conflict years) and again from 1999 to 2002. This, therefore, suggests that, at least initially, the major characterising force for fertility declines in Azerbaijan was that of a

"stopping-sooner" behaviour in years characterised by deteriorating economic conditions and conflict violence. This fast-declining tendency to have a third birth, coupled with the fact that, at least until 2002, virtually all women in Azerbaijan had a first birth after marriage (about 92%) sets up parity two as the key birth decision in this context.

To explore more in detail whether conflict violence had any consequence on fertility, I estimated TFR from the AZ-DHS for exposed and not-exposed women (Figure 2.5). First, while both groups experienced an overall decline in fertility, the drop during peak conflict years is more visible and continuous for exposed women. For this group, the decline extended to 1997, when the TFR point estimate dipped below the replacement level. This was largely the result of a declining rate among adolescent and young adult exposed women (Figure 2.6).[28] For instance, fertility dropped from about 224 children per 1,000 exposed women aged 20–24 in 1992 to 150 in 1996. Rates for the not-exposed declined at all ages (except for adolescents), but less rapidly for young adults, suggesting age-related different responses in times of violence and dire economic conditions. After 1997, trends for the exposed become more erratic. While the lowest estimated TFR value for both groups was in 2001 (about 1.65 children per woman), since then there is evidence of compensatory rises among the more conflict-exposed, adult women in particular. Nonetheless, confidence intervals for the two groups overlap in all years, indicating no significant differences in total fertility during the studied period.

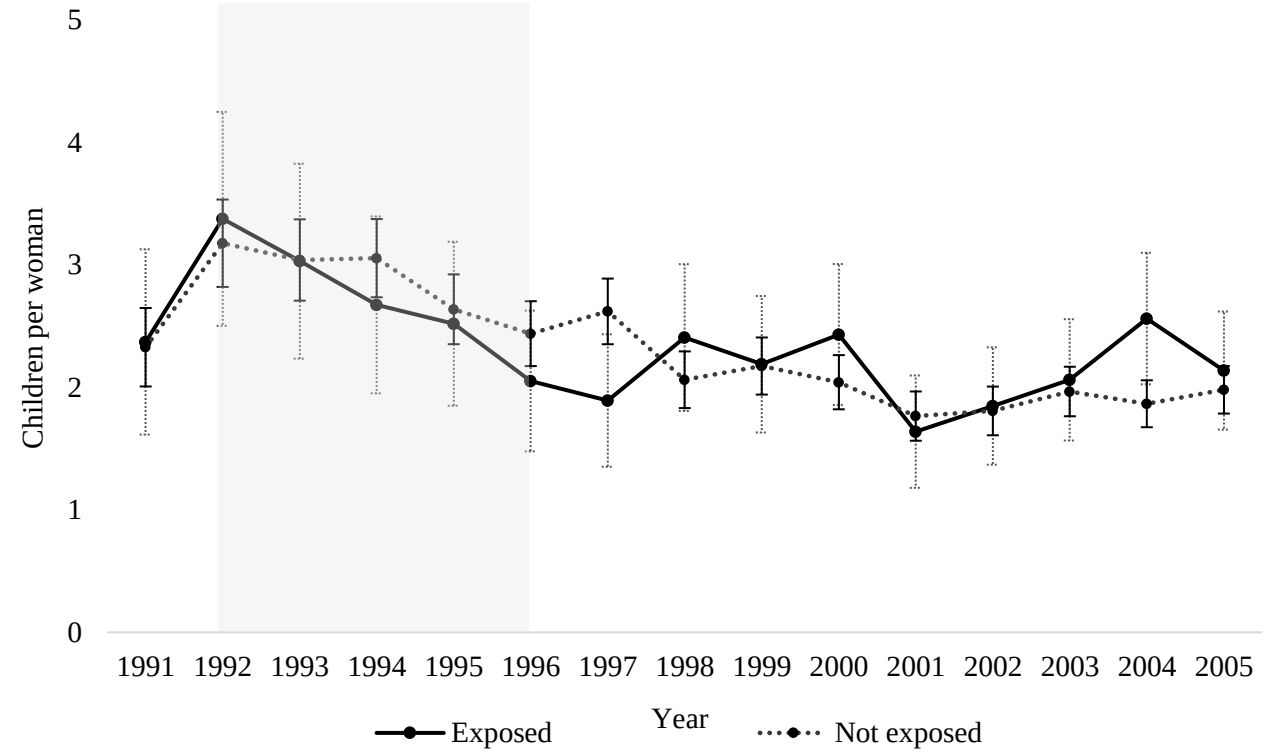
[28] Note that here trends are shown as 3-year moving averages to smooth annual fluctuations due to sample size, especially among the exposed group.

Figure 2.4 Parity progression ratios, Azerbaijan 1991–2005



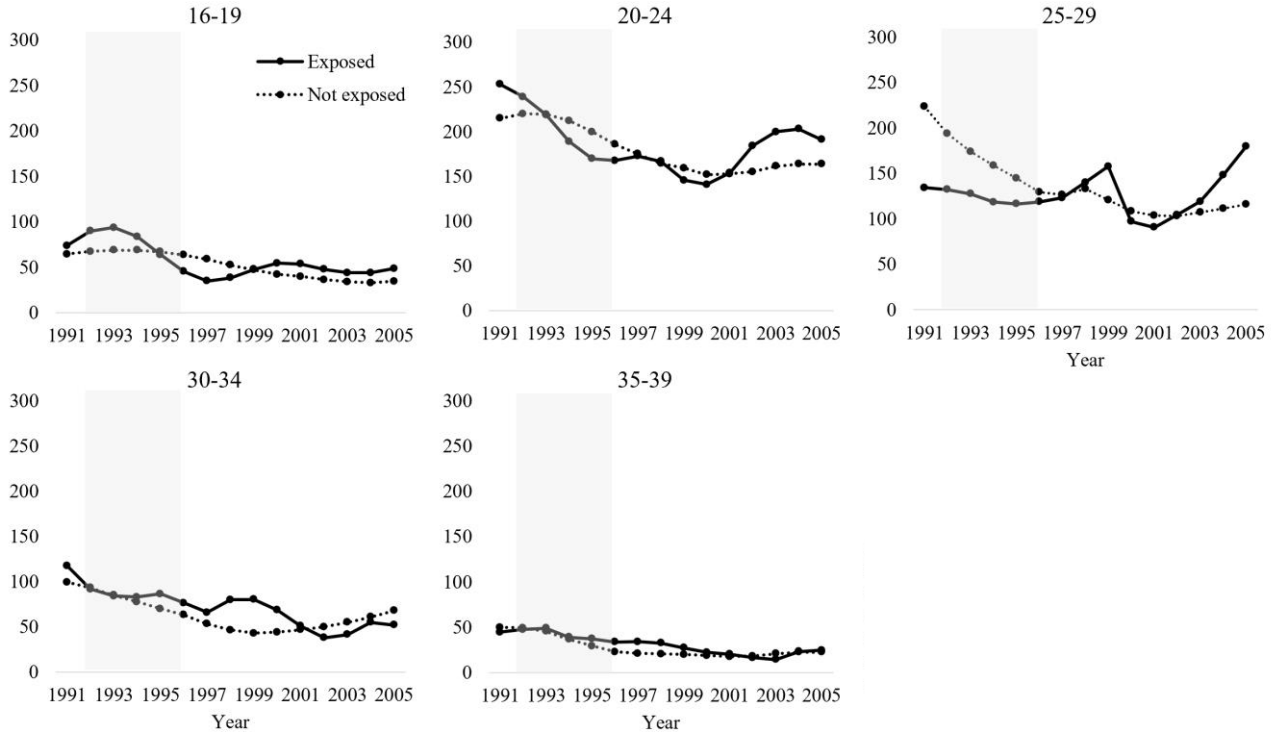
Source: 2006 AZ-DHS (ever-married women). Note: 3-year moving averages. Shaded area highlights key conflict years.

Figure 2.5 Total fertility rate by conflict exposure, Azerbaijan 1991–2006



Source: 2006 AZ-DHS (women aged 16–39). Note: Exposed women are defined according to the broad definition. This includes women who (i) always resided in Karabakh, (ii) self-identify as refugees from Armenia/IDPs from Nagorno-Karabakh or (iii) were not refugees or IDPs, but whose husbands were.

Figure 2.6 Age-specific fertility rates by conflict exposure, Azerbaijan 1991–2005



Source: 2006 AZ-DHS (women aged 16–39). Note: 3-year moving averages. Exposed women are defined according to the 'broad' definition. This includes women who (i) always resided in Karabakh, (ii) self-identify as refugees from Armenia/IDPs from Nagorno-Karabakh or (iii) were not refugees or IDPs, but whose husbands were. Shaded area highlights key conflict years.

2.6 Armed conflict and childbearing transitions

The previous section showed that since 1991 Azerbaijan experienced a fertility decline at the aggregate level, engineered predominantly via a "*stopping-sooner*" behaviour at parity three and incipient first birth postponement towards the end of the observation period. An established falling propensity to have a third birth, accompanied by an almost universal transition to motherhood, leads to the hypothesis that – if the relationship between conflict and fertility indeed differs by parity – then the influence of violence should be strongest on the decision to transition to the second birth in this context. As aggregate measures of fertility computed for long periods of time though may not be robust enough to detect the underlying trend of the decline and to fully capture the effects of conflict at different birth orders, I next assess this hypothesis with event history analyses.

Table 2.2 summarises the main results of discrete-time logit models for all transitions estimated for three sample groups: all women, conflict-exposed women and not-exposed women, defined as per the "broad" definition of conflict exposure.[29] Each transition is discussed separately in the following subsections.

2.6.1 Transition from marriage to first birth

The analysis starts by presenting the odds ratios for the transition to the first birth after marriage. Results from the full all women sample model (Table 2.2, Panel A, Col. *a*) show that, although the odds of having a first birth after marriage in any given year is about 14% higher for women exposed to conflict, the difference with not-exposed women is not statistically significant. As it could be expected from populations where the fertility transition is realised via reductions at high parities, there is no evidence of a decline in the risk of first birth across calendar years relative to 1992 – the year when conflict hostilities erupted in full. Rather, coefficients on calendar year point towards significant increases, particularly in the early post-conflict period as well as in the early 2000s. For instance, the odds of transitioning to a first birth in 1998 and 2002 for women (with the same unobserved characteristics) are respectively almost three times and 76% higher than in 1992 (Col. *a*). These results suggest that, at least until the first years of the new century, motherhood was still a universal phenomenon in Azerbaijan. To explore whether coefficients on calendar year then differed within each conflict group, I first estimate models for each conflict subsample separately (Cols. *b* and *c*). Results show increases in first birth probability in both exposed and not-exposed subgroups in the early conflict and post-conflict years. However, these positive associations are significant only within the group of not-exposed women. In the subsample of women exposed to conflict hostilities, the positive increase is only observed in 1998.

[29] Extended tables for all the transitions and conflict groups are reported in Appendix A, Tables A2.1, A2.2 and A2.3. For the all women sample, each Table reports estimates from a model including only the conflict exposure measure (Column *a*), only calendar year (Column *b*), both variables (i.e., the full model, Column *c*) and a model that includes the interaction between calendar year and the conflict exposure measure (Column *d*). Columns *e* and *f* report results for the full model for the subsamples of women non-exposed and exposed to conflict respectively.

Table 2.2 Odds ratios of first, second and third birth, ever-married women by conflict status

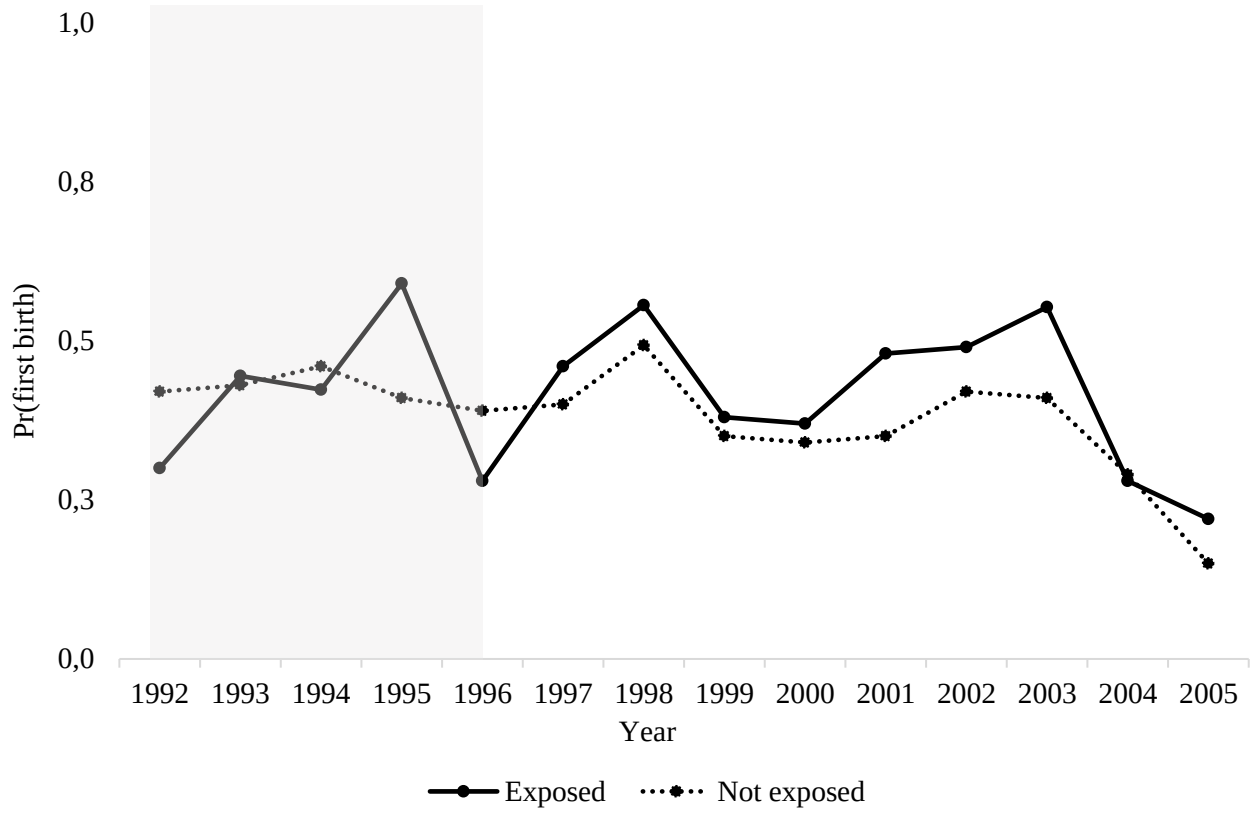
	All women	Not-exposed	Exposed
PANEL A: 1ST BIRTH			
Conflict exposure (ref: no)			
Yes	1.145		
Calendar year (ref: 1992)			
1993	1.683*	1.626*	2.692
1994	1.890**	1.904**	2.370
1995	1.673	1.569	3.954
1996	1.423	1.574	1.054
1997	2.199**	2.195*	3.048
1998	2.800***	2.848**	3.872*
1999	1.468	1.552	1.922
2000	1.197	1.192	1.569
2001	1.238	1.110	2.591
2002	1.765*	1.698	2.830
2003	1.712	1.528	4.648
2004	1.102	1.148	1.093
2005	0.170***	0.133***	0.568
σ_u^2	2.642	3.179	1.074
$N_{w,y}$	5349	4650	699
PANEL B: 2ND BIRTH			
Conflict exposure (ref: no)			
Yes	1.417***		
Calendar year (ref: 1992)			
1993	0.818	0.851	1.052*
1994	0.847	0.822	1.064*
1995	0.682*	0.705*	0.425
1996	0.654*	0.689*	0.422
1997	0.623*	0.660*	0.414
1998	0.670*	0.701*	0.521
1999	0.705*	0.709	0.717
2000	0.433***	0.464***	0.274*
2001	0.562**	0.576**	0.431
2002	0.619*	0.620*	0.549
2003	0.608**	0.605**	0.608
2004	0.692	0.694	0.654
2005	0.107***	0.100***	0.134**
First child died during conflict years (ref: no)			
Yes	2.378*	0.435	6.715***
σ_u^2	0.149	0.100	0.486
$N_{w,y}$	8630	7545	1085

PANEL C: 3RD BIRTH			
Conflict exposure (ref: no)			
Yes	0.855		
Calendar year (ref: 1992)			
1993	1.041	1.105	0.699
1994	0.743	0.802	0.439
1995	0.738	0.795	0.452
1996	0.877	0.976	0.418*
1997	0.703	0.767	0.386
1998	0.764	0.826	0.461
1999	0.548**	0.623	0.212*
2000	0.633*	0.719	0.256*
2001	0.452***	0.534**	0.135**
2002	0.544**	0.595*	0.306*
2003	0.669	0.760	0.291*
2004	0.661*	0.675	0.541
2005	0.304***	0.300***	0.311*
Second child died during conflict years (ref: no)			
Yes	8.330***	7.841***	20.032***
σ_u^2	0.014	0.031	0.006
$\mathbf{N_{w,y}}$	19730	17182	2548

Source: 2006 AZ-DHS. Columns represent exponentiated coefficients (odds ratios). Notes: All regressions control for time since start of exposure (<2, 3-6, 7-10, 11+ years), education (secondary or less, secondary-special, higher), residence type (urban, rural), age at marriage (linear and squared) for first birth, age at first birth and at second birth, sex of the previous child for second and third birth respectively. $N_{w,y}$: number of years of exposure in total analysis period for sampled women. Regressions are all specified with frailty terms at the woman-level. Subjects enter analysis at date of marriage for first birth and 7 months after the previous birth for subsequent births. Extended Tables are reported in Appendix A. *p<0.05, **p<0.01, ***p<0.001.

Lastly, to further explore the impact of conflict in specific tumultuous years, I re-estimated the all-women sample model now adding an interaction term between calendar years and the conflict exposure variable (see Table A2.1, Col. *d* in Appendix A). The results of the interaction can be best visualised in Figure 2.7. Overall, although the trend for the most affected by the hostilities is more erratic and characterised by wider fluctuations, the groups largely follow a similar pattern, indicating no significant difference in the association with calendar year by conflict exposure, neither during the conflict period nor in the post-truce years. Interestingly, by the end of the observation period, first birth probabilities for the more exposed are similar to those observed at conflict onset and very close to those of the not-exposed.

Figure 2.7 Predicted probabilities of first birth by conflict exposure interacted with calendar year



Source: As per Table A2.1, Col. *d* in Appendix A. Other predictors are set to their mean values. Shaded area highlights key conflict years.

With regard to the other variables included in the models, the risk of first birth is only significantly associated with age at marriage, and the relationship is curvilinear: the odds of experiencing a first birth increase substantially to then decline as marital age increases. By contrast, place of residence and education have no association with the risk of transitioning to the first birth (for results of all covariates, see Table A2.1 in Appendix A).

In brief, being exposed to conflict does not appear to influence the probability of having a first birth after marriage. Conversely, what emerges is a trend of unchallenged universal motherhood in Azerbaijan that persisted at least until the start of the new century. Only towards the end of the observation period there are mild indications of incipient first birth postponement and convergence in probability between women exposed differently to the conflict.

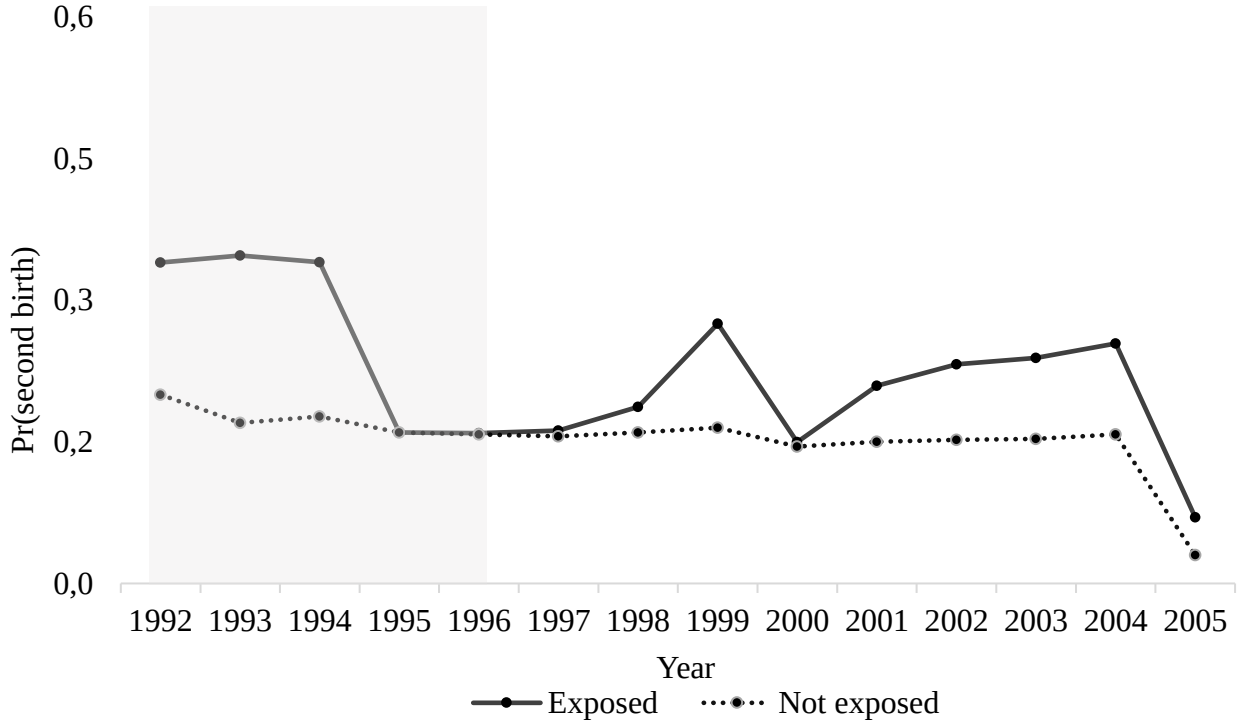
2.6.2 Transition from first to second birth

Panel B in Table 2.2 presents the main odds ratios from models predicting the transition from a first to a second birth for the all-women sample, for exposed and not-exposed conflict women separately. An overall time-independent conflict-exposure difference in the probability of a second birth is visible and is statistically significant in the all women sample model (Col. *a*). In particular, for women with the same unobserved characteristics, the odds of experiencing a second birth are 42% higher for respondents exposed to violence than for those who were not directly affected by the Nagorno-Karabakh conflict. Coefficient size remains large and significant in all model specifications (see Table A2.2 in Appendix A) as well as when controlling for regional differences in fertility.[30] Furthermore, all things equal, the odds of transitioning to a second birth are about 2.38 times higher if women experienced child death during key conflict years. When models are estimated for exposed and not-exposed women individually, I observe that the loss of a child during conflict years significantly and substantially affected the probability of having a second birth (about 6.7 times higher) in the group of exposed women only, providing indications of replacement of children lost during conflict periods.

[30] Results controlling for regional differences in fertility are not shown, but yielded very similar estimates.

Differently from the transition to first birth, significant declines in the probability of a second birth are visible in the Azerbaijani population as a whole soon after independence. Yet, models for each conflict subgroup (Panel B, Cols. *b* and *c*) show some differences across calendar periods, especially in years characterised by violence: although the odds of transitioning to the second birth compared to 1992 declined in each year following independence in the all women sample, the conflict-specific models show that in practice the drop in second birth probability was significant among the not-exposed to violence only. This group experienced a general smoother and essentially continuous downward trend. In contrast, a 5-6% increase in risk is observed for the more exposed in 1993-4, reflecting higher conceptions and births at the beginning and during the full-scale conflict. Hence, to further test period differences between conflict-exposed and not-exposed women, I re-estimate the all-women sample model with an interaction between the two variables (Table A2.2, Col. *d* in Appendix A). Figure 2.8 graphically presents the results in the probability metric. Again, there is evidence of significant increases in the probability of transitioning to the second birth in years characterised by violent conflict for women exposed to such fighting. In the post-truce years (1994-

Figure 2.8 Predicted probabilities of second birth by conflict exposure interacted with calendar year



Source: As per Table A2.2, Column *d* in Appendix A. Other predictors are set to their mean values. Shaded area highlights key conflict years. Note that the y-axis tops at 0.60.

onwards), the difference vanishes, although in the early 2000s there is a steady surge in second birth probability across both conflict groups, possibly more marked for the exposed.

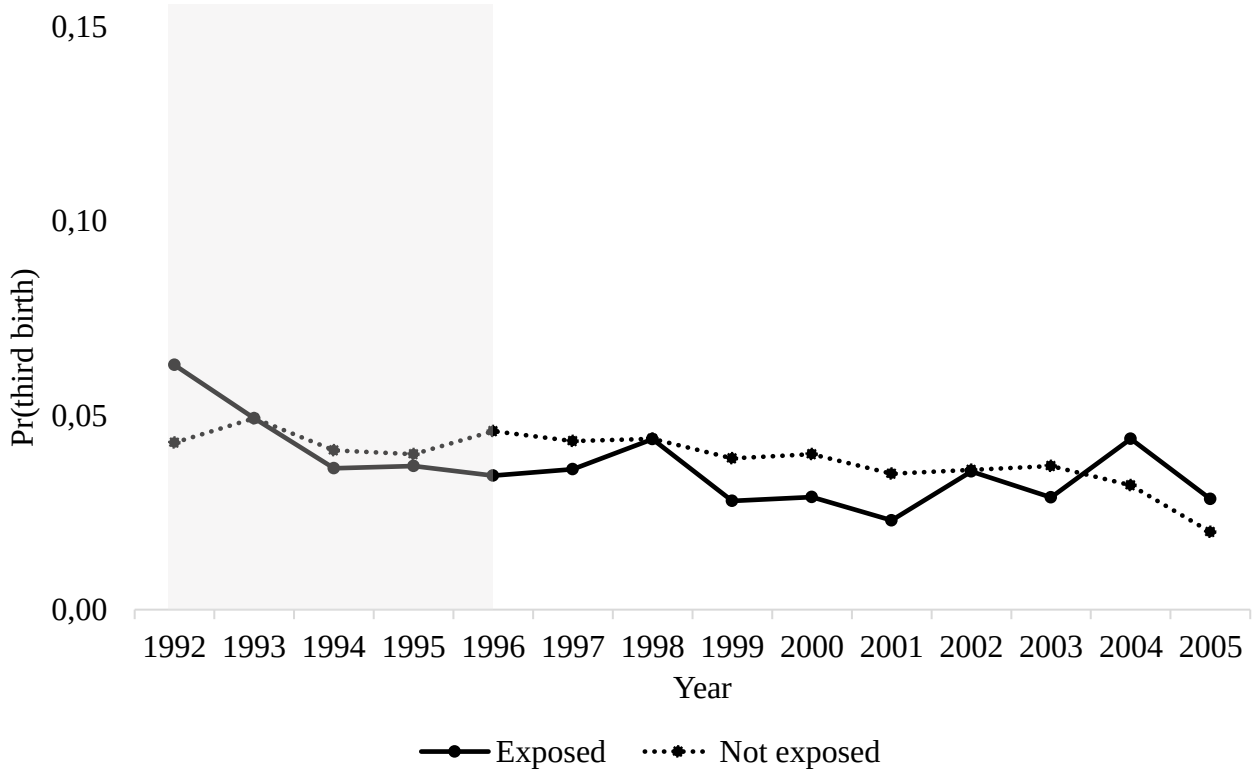
As for other covariates, there are significant negative associations between high education and age at first birth and the probability of progressing to a second birth (see Table A2.2 in Appendix A). Rural background is a strong predictor in all models, increasing the odds of second birth over urban by about 62% in the all women sample models and by 82% in the conflict-exposed subsample. The sex of the first child is another important covariate influencing the propensity to have a second child in Azerbaijan: the odds for women whose first child was female are 8% higher than for women who had a boy. Yet, this relationship is only detected among not-exposed women, suggesting that patriarchal values more than conflict-related motives feed the idea of the "added" value of having a son.

2.6.3 Transition from second to third birth

The main results for analyses on the transition to third birth are reported in Panel C of Table 2.2. As for the first birth, the risk of having a third child is not significantly associated with exposure to conflict violence, controlling for calendar year and other covariates. However, results show that the risk is 8-fold for women who reported experience of child death during conflict years, the second proxy used to assess exposure to traumatic conflict-related events. The impact of child loss during conflict years is strong across all the models, but is appreciably larger in magnitude for women exposed to conflict. Although this is likely to be due to the limited number of second child deaths that occurred in the conflict period (less than 2%), it could suggest replacement- and risk-insurance effects even in contexts where declines in high-order fertility are the predominant way to engineer the fertility transition. As observed for the transition to the second child, younger age at previous birth, rural residence, and sex composition of previous offspring are all significantly and positively associated with the probability of having a third birth in the Azerbaijani population as a whole and in the not-exposed group. Except for the sex of prior children, these variables correlate, albeit more mildly, with the risk of transitioning to the third child for exposed women (see Table A2.3 in Appendix A).

There are some small, yet noteworthy different temporal trends by conflict exposure. Over the conflict years, there are no significant period differences in the risk of transitioning to the third birth in all groups, although predicted probabilities from the model with the year-exposure interaction (Figure 2.9) show a large decline for more exposed women between 1992-1994. In the post-conflict years, though, the downward trend becomes significant earlier and is more pronounced in this latter group: the likelihood of a third birth was already about 60% lower in 1996 than in 1992 for women exposed to the conflict and continued to decline until the first years of the new century, when it starts to display a rising trend. By contrast, in the not-exposed group, there is evidence of a significant 'stopping sooner'-type of behaviour around the early 2000s only, suggesting that most of the decline for this parity transition had been achieved before conflict onset.[31]

Figure 2.9 Predicted probabilities of third birth by conflict exposure interacted with calendar year



Source: As for Table A2.3, Column *d* in Appendix A. Other predictors are set to their mean values. Shaded area highlights key conflict years. Note that the y-axis tops at 0.15

[31] Models estimated using calendar years 1980-2005 show in fact that the probability of a third birth declined well before independence and the conflict with Armenia in the population of Azerbaijan as a whole, but also in the two conflict subpopulations. The drop was much more marked in the more exposed group as their likelihood of having a third birth was on the rise and way higher than that of the non-exposed in the early 1980s.

2.7 Alternative measures and robustness checks

To further explore the strength of the above results, I estimate the all-women sample model for all three transitions using the alternative "narrow" definition of conflict exposure. Results remain practically unchanged when only women who were directly affected by conflict violence are included in the models as "exposed" (see Table B2.1 in Appendix B).[32]

A dichotomous identification of conflict exposure provides information on the association with the transition of interest. However, a binary measure of this kind may mask different responses within groups that have been diversely affected by conflict violence. For instance, women who reside in the conflict-affected districts of Upper-Karabakh and who, thus, decided not to migrate, may have different fertility responses than refugees or IDP women, who experienced the stress of forced migration, but may have also relocated to more secure zones, farther away from core conflict areas. For this reason, models for all the three transitions were estimated by disaggregated conflict status, i.e., for not-exposed women, never migrant women residing in the Upper-Karabakh region, and for IDP/refugee women who were forced to abandon their homes due to conflict. Tables A2.4, A2.5 and A2.6 in Appendix A report the results for the three transitions.

The estimated odds ratios suggest that indeed different behaviours have been at play across different conflict subgroups. As it already emerged in previous models, the risk of a second birth is much higher (between 41-45% higher) for the conflict groups as compared to the not-exposed population. This remains true when the year/exposure interaction is included in the model (Table A2.5, Col. *b*). Again, the coefficient on particularly tumultuous years (e.g., 1992-1994) for the transition to second birth is different for both refugee/IDP and Upper-Karabakh residents as compared to not-exposed. When models are estimated separately for each conflict group subsample to explore whether the relationship with covariates varies by conflict exposure, I observed that replacement effects for first children who died during conflict years are only visible in the IDP/refugee subgroup. Similar to

[32] Note that models including an interaction term between calendar year and the 'narrow' conflict exposure measure are not shown in the interest of space. Results do not vary from models using the 'broad' definition.

models using a dichotomous definition of conflict exposure, the risk of transitioning to the third child does not vary between different conflict subgroups and the non-affected population, but the coefficient on the child loss variable is sizeable in the subsample of IDP/refugees. Notably and differently from before, the odds of having a first birth are significantly higher (about 42%) for women living in the Upper-Karabakh region compared to non-affected women. For IDP or refugee women, such risk at any given time is not different from that of the not-exposed. Hence, a binary definition hides some differences in the relationship between fertility and exposure to conflict conditions, in a way that highlights how a more direct and continuous exposure, not mediated by migration, can influence households' decisions on the first birth already.

2.8 Limitations

Examining the timing of different parities and its relationship with conflict violence using retrospective data, as this paper does, bears a number of limitations. First, the study of the transition from parity *j* to *j*+1 introduces the problem of selectivity in that each transition can be analysed only for those women who have already reached parity *j* (or marriage) at the time of the survey. I sought to tackle such selectivity issues as much as possible by controlling for theoretically relevant socio-economic and demographic covariates as well as by allowing for unobserved heterogeneity among women. Another similar issue that could affect fertility estimates relates to the occurrence of selective outward migration before survey implementation. As noted earlier, however, international emigration from Azerbaijan following the collapse of the USSR concerned principally ethnic Russians and Armenians (Aliyev 2006), who are not the focus of this study. More generally, assessments and simulations have also shown that the bias in retrospective estimations of fertility resulting from selective migration tends to be small (Abbasi-Shavazi 1997; Spoorenberg 2014).

Second, as much as birth histories reveal historical trends in fertility, DHS data do not permit a more detailed examination of changes in the socio-economic position and conflict status of women over time, and in particular during periods of wide social turbulence due to conflict and economic restructuring. This makes it difficult to disentangle the effects on childbearing outcomes of conflict-

caused economic dislocation and of the economic downturn due to the collapse of the USSR. Nonetheless, information on conflict-related migration patterns of individuals, as well as detailed data on death of children, in the survey served to identify those groups that, on top of difficulties caused by the collapse of the USSR, have also endured the harsh consequences of conflict violence such as forced migration. Hence, the estimates presented here provide some evidence that the conflict itself, above and beyond the economic crisis alone, is associated with fertility outcomes in Azerbaijan.

Lastly, seeking to understand the different pathways through which conflict is associated with childbearing outcomes by looking at different population subgroups inevitably exposes the research findings to possible estimation issues due to small sample size. Unfortunately, this also narrows the amount of sub- and fine-grained analyses I am able to perform. It would have been interesting, for instance, to create a separate indicator and estimates for the group of women who were not IDP/refugees themselves, but who were married to one and explore differences for each transition specific to this subgroup; equally, to differentiate the relationships for refugees who came to Azerbaijan at different stages of the conflict. Yet, the small sample size – which further reduces at each transition – and lack of detailed migration histories preclude sensible estimations of this kind. More broadly, although the size of the coefficient on the second birth is large and results are consistent in the robustness checks, this constraint highlights one of the reasons why conflict influences on fertility and driving mechanisms are scarcely studied at the micro-level. More efforts are required to develop new or expand existing survey tools (e.g., simple oversampling of conflict-exposed populations and wider number of conflict-related questions in questionnaires) that can help researchers better identify those exposed to violence as well as the type of violence they experienced (Brück et al. 2016).

2.9 Discussion and conclusion

This study is the first to provide a detailed account of fertility changes in Azerbaijan since independence and to directly investigate the association between armed conflict and childbearing outcomes in the post-Soviet world. Trend analyses showed that, after the collapse of the USSR and

the start of the full-scale conflict with Armenia, TFR declined for all women, particularly as a result of falling progression to the third birth. Declining rates were evident across all age categories and, in the early post-independence years, visibly in young adult conflict-affected women. This indicates the type of fertility changes Azerbaijan has undergone over time in its general population, but also in various subgroups, and can guide prediction on future population developments and comparisons with analogous, but more studied countries in the former USSR space.

The finding of a general "stopping-sooner" behaviour in the early post-independence years mirrors what has been found in much of the literature on fertility changes in countries that experienced harsh economic downturns following the Soviet breakdown. In Armenia and in ex-Soviet Central Asian republics, for instance, the early 1990s were characterised, as well, by fertility declines engineered via limitation of higher-order births rather than birth postponement (Agadjanian 1999; Agadjanian and Makarova 2003; Billingsley 2011; Clifford et al. 2010). In the subsequent decades, with economic recovery and the evolution of nation-building processes, patterns of first birth postponement began to emerge in these settings (Billingsley 2010; Billingsley and Duntava 2017; Spoorenberg 2013). Net of conflict effects, this bi-phasic model of fertility decline – that is, reductions driven by birth limitation at high parities during periods of crisis and by the postponement of family events once the economy develops (Lerch 2018) – may also apply at the national level to Azerbaijan. My analyses point in this direction. After dipping below 2 children per woman, between 2002-2005 – when Azerbaijan's economy expanded and experienced steady trade surpluses (World Bank 2014) – period fertility stabilised around the replacement level with starting signs of slower progression to parity one in the general population. Any discussion on recent patterns of fertility in Azerbaijan is, however, only speculative with the data at hand. More up-to-date micro-level information than the survey data used in this paper is required to further explore the hypothesis of a bi-phasic model of fertility transition, understand its current underlying mechanisms and, importantly, investigate how they play out among Azerbaijan's various conflict subgroups.

Beyond understanding Azerbaijan's post-independence fertility trajectories, I also examined in greater depth the relationship between the observed trends and women's exposure to conflict violence

resulting from the Nagorno-Karabakh war. Most studies on conflict and fertility limit the analyses to the first birth or approach the relationship more generally by looking at children ever born or at other aggregate measures of fertility without considering the timing of such births (Nepal et al. 2018). By contrast, I addressed the possibility that the impact of political violence and tensions vary at different birth orders depending on the country's stage in the fertility transition. This hypothesis suggests that conflict and related uncertainty will impact more strongly the decision to transition to the average parity level in the population. In the Azerbaijani context – characterised by almost universal motherhood and by limitation at high-orders – that is the second birth.

The main findings of this research support this hypothesis. While the probability of transitioning to the first and third birth did not differ between those affected and those not exposed to conflict violence, visible differences emerged for the transition to second birth. Women who have been exposed to conflict violence – whether residents in Upper-Karabakh, IDPs or refugees – have around 42% higher chances of having a second child than not-exposed ones. This probability was also larger in highly violent years for conflict-affected women, while for the Azerbaijani population as a whole, it began to decline in the early post-independence period. This result suggests that different behaviours have been in place: on the one side the non-affected population responded to parlous economic conditions by continuously lowering second-order fertility; by contrast, those who were also affected by political violence did the opposite in highly violent years or recuperated their second births as conditions became more stable.

From a theoretical point of view, this finding resonates with the "fertility promotion" hypothesis (Fargues 2000; Kraehnert et al. 2019; Abbasi-Shavazi et al. 2009). In a context where one-child families are becoming slowly, but progressively, more prevalent, several factors could explain this higher propensity of conflict-affected women to have children. The first relates to risk-insurance mechanisms. Enlarging household size could represent an intentional coping strategy for conflict-affected families, not only in the long-term, when grown-up children can provide additional resources to the family nucleus through, for instance, paid work. If economic assistance and support are provided to conflict-affected groups by national and/or international authorities, there might also be

short-term incentives to increase household size. The government of Azerbaijan has for long devoted an important share of its GDP to its displaced population and set up IDP-specific social transfers like exemptions from utility payments, monthly allocations for basic foodstuffs and deduced income tax rate (World Bank 2010; Gureyeva-Aliyeva and Huseynov 2011).[33] Although there are no IDP/refugee-specific social transfers that can be directly linked to fertility and the amounts of birth grants and childcare benefits available to the Azerbaijani population as a whole are relatively small,[34] it is possible that some of these government support schemes exert some influence over IDP/refugees' propensity to have children, especially if they also struggle with poverty. Risk-insurance mechanisms might also well apply at the macro-level: in a conflict where warring groups base territorial legitimacy on population size, as in the Nagorno-Karabakh case, the perceived need to keep a demographic balance with the opposing faction at the group-level could explain the observed higher risk for conflict-affected women, and particularly for Upper-Karabakh residents.

A second plausible mechanism stems from the finding that experiencing child loss during conflict years is strongly and positively associated with higher fertility, irrespective of parity level.[35] This is consistent with child replacement effects and echoes results from other countries experiencing economic- and violence-related crises (Kraehnert et al. 2019; Verwimp and van Bavel 2005). I find that this occurs independently of the sex of previous births. By contrast, the sex of prior children in itself is only influential for the transition to the next birth among non-affected women. In Azerbaijan, where levels of sex ratio at birth have been historically high (Douthé et al. 2012; Guilmoto 2009; Meslé et al. 2005; Yüksel-Kaptanoglu et al. 2014), this could indicate that the "added" value of having a son results from patrilineal societal structures and patriarchal values more than from shared feelings

[33] As of 2010, the government of Azerbaijan spent nearly 3% of its yearly GDP on assistance programs and social support for IDPs (World Bank 2010; Gureyeva-Aliyeva and Huseynov 2011).

[34] For instance, a lump sum payment for the birth of a child is paid to all families (about €44.2 in 2008). Equally, benefits for children aged up to 1 year are paid to all low-income families (about €16.30 per month). IDP school children however receive free education supplies (Asian Development Bank 2012; European Commission 2011).

[35] While I could not find any independent estimate of the number of children directly killed by the conflict, a detailed report by UNFPA (2015) shows that in the period 1990-94 infant and child mortality showed an increase at the national level compared to the preceding years. The same report also attempted to draw a sub-national picture of territorial variation in infant and child mortality. Admittedly though, a variety of issue of data quality, including incomplete birth and death registration, make those estimates not fully reliable.

of external threat to group survival or conflict-related motives (Abbasi-Shavazi et al. 2009; Das Gupta and Shuzhuo 1999; Mavisakalyan and Minasyan 2018).

A third and related element that emerges from the analyses is that people's experience of conflict violence matters for their fertility responses (Kraehnert et al. 2019). This is evident not only from the higher hazards of second and third birth for women who had the traumatic experience of child death during conflict years; also the finding of higher first order fertility in the non-migrant group of Upper-Karabakh women only points towards this idea of a differential response depending on one's experience – whether direct and immediate or indirect and more chronic – of conflict-related uncertainty and stressors. Further, this could signal the disruptive effects of forced migration on the early childbearing outcomes of women who fled from Nagorno-Karabakh as well as their possible assimilation to the behaviour of the non-affected population as they re-settled away from the conflict zones. Although the fertility patterns of IDPs have rarely been studied (perhaps because of the assumption of relatively homogeneous fertility trends within countries), findings from studies on refugee populations (Williams et al. 2013) and voluntary internal migrants (Daudin et al. 2019; Kulu 2005) suggest more-or-less rapid assimilation to the average levels of fertility of the receiving population. Hence, there is reason to suppose that similar long-run patterns have emerged among IDPs in Azerbaijan.

The role of pre-conflict norms and pre-existing characteristics of each population subgroup is also likely to affect the kind and extent of their fertility responses and should thus not be ignored. In the case of Azerbaijan, the pre-war predominantly rural character of women then exposed to the conflict[36] could have played a role and partially explain the higher overall childbearing risk of this group. Equally, another relevant and linked aspect that could account for the observed differences concerns the degree to which family planning resources and reproductive health services were accessible and

[36] According to the 1989 USSR Census (Demoscope Weekly. USSR Population Statistical Collection 2016) the vast majority of ethnic Azerbaijani living in Armenia was concentrated in rural areas (77 721 individuals out of 84 860 lived in rural zones of Armenia). Equally, there is evidence that the Azerbaijani population living in Nagorno-Karabakh before the conflict (later displaced) had a higher rate of population growth, especially in rural areas of the region (Yamskov 1991; Demoscope Weekly 2016).

available before, during and after the hostilities to vulnerable, conflict-affected women, particularly in rural areas (Verwimp and van Bavel 2005). If basic, perhaps already limited, reproductive health services are disrupted or become difficult to obtain as a result of conflict, women may see their access to adequate family planning methods and related knowledge, including modern contraception and safe abortions, sharply curtailed in a situation of heightened threats (McGinn et al. 2011; McGinn 2010). This in turn can translate into higher fertility, at least in the short-term when dislocation occurs, and humanitarian assistance is not yet fully in place. The fact that a higher risk of a second birth for conflict-exposed women was observed particularly in the first two years of violence may be an indication of this lack of appropriate reproductive healthcare provision.

Besides feeding the theoretical debate on the mechanisms linking conflict and fertility, these findings concern policy-makers: in a context where fertility has been oscillating around the replacement level, if households more affected by violence are also at a less advanced stage in the fertility transition, *ceteris paribus*, their size and number relative to the not-exposed is going to increase with time, and their needs are going to become increasingly pressing. This highlights the importance of ensuring safe access to and availability of reproductive health services, including family planning, for conflict-affected and displaced households in times of intense conflict, but also in the aftermath of sustained fighting. Careful logistical planning of health services, especially in remote conflict-affected areas and among IDP/refugee communities, as well as attention to modern contraception and family planning counselling are required. In countries like Azerbaijan, where abortion is widespread and often used as the primary method of fertility regulation, and where it is reportedly difficult for some women and most men to openly discuss fertility-related issues, such interventions could help convergence in fertility among conflict-affected and non-affected groups, in particular if the higher levels in the former are driven by unintended births.

Overall, however, responsibilities should not be left to national decision-makers only. Concerted efforts at the international level to work towards reaching a credible peace settlement to the conflict in and around Nagorno-Karabakh should be prioritised. This is important for the development of both Azerbaijan and Armenia. More generally in today's world, where, as in Nagorno-Karabakh, but also

in settings as Transnistria, South Ossetia and Abkhazia, and until recently Crimea, to limit ourselves to the post-Soviet sphere – there is a tendency to "freeze" conflicts instead of finding durable solutions, with the risk that persisting tensions will "thaw" violently

2.10 Appendix A

Table A2.1 Odds ratios of first birth after marriage, ever-married women

	All women				Not-exposed	Exposed
	(a)	(b)	(c)	(d)	(e)	(f)
Conflict exposure (ref: no)						
Yes	1.109		1.145	0.500		
Time since first birth (ref: <2 years)						
3-6	0.269***	0.254***	0.254***	0.257***	0.255***	0.329**
7-10	0.048***	0.042***	0.042***	0.042***	0.042***	0.067**
11+	0.032***	0.028***	0.028***	0.028***	0.041***	0.002***
Calendar year (ref: 1992)						
1993		1.688*	1.683*	1.538	1.626*	2.692
1994		1.894**	1.890**	1.783*	1.904**	2.370
1995		1.678	1.673	1.482	1.569	3.954
1996		1.430	1.423	1.496	1.574	1.054
1997		2.214**	2.199**	2.030*	2.195*	3.048
1998		2.816***	2.800***	2.633**	2.848**	3.872*
1999		1.479	1.468	1.468	1.552	1.922
2000		1.205	1.197	1.144	1.192	1.569
2001		1.246	1.238	1.069	1.110	2.591
2002		1.773*	1.765*	1.595	1.698	2.830
2003		1.721	1.712	1.435	1.528	4.648
2004		1.108	1.102	1.077	1.148	1.093
2005		0.170***	0.170***	0.138***	0.133***	0.568
Calendar year (ref: 1992) * Exposure						
1993 * Yes				2.471		
1994 * Yes				2.011		
1995 * Yes				3.632		
1996 * Yes				0.900		
1997 * Yes				2.464		
1998 * Yes				2.218		
1999 * Yes				1.418		
2000 * Yes				1.894		
2001 * Yes				3.783		
2002 * Yes				2.927		
2003 * Yes				5.440		

2004 * Yes				1.505		
2005 * Yes				4.679*		
Education (ref: secondary or less)						
Secondary-special	1.186	1.171	1.167	1.183	1.145	1.365
Higher	1.438	1.510	1.514	1.529	1.402	2.392
Residence type (ref: urban)						
Rural	1.118	1.168	1.173	1.173	1.255	0.857
Age at marriage	1.539***	1.576***	1.576***	1.578***	1.570***	1.998**
Age at marriage squared	0.989***	0.988***	0.988***	0.988***	0.988***	0.984***
σ_u^2	2.488	2.656	2.642	2.737	3.179	1.074
$\mathbf{N_{w,y}}$	5349	5349	5349	5349	4650	699

Source: 2006 AZ-DHS. Exponentiated coefficients. Notes: Column *a* presents results for the full-sample model with the conflict indicator and controls only; Column *b* presents results for the full-sample model with calendar year and controls only; Column *c* presents results for the full-sample model with all variables; Column *d* adds an interaction term between calendar year and the exposure variable; Columns *e* and *f* present results for models with all variables for samples of each conflict group separately. $N_{w,y:}$ number of years of exposure in total analysis period for sampled women. *p<0.05, **p<0.01, ***p<0.001.

Table A2.2 Odds ratios of second birth, ever-married women

	All women				Not-exposed	Exposed
	(a)	(b)	(c)	(d)	(e)	(f)
Conflict exposure (ref: no)						
Yes	1.392***		1.417***	1.741*		
Time since first birth (ref: <2 years)						
3-6	0.546***	0.456***	0.463***	0.463***	0.438***	0.800
7-10	0.123***	0.102***	0.104***	0.104***	0.099***	0.222
11+	0.013***	0.013***	0.013***	0.013***	0.014***	0.010***
Calendar year (ref: 1992)						
1993		0.819	0.818	0.818	0.851	1.052*
1994		0.846	0.847	0.833	0.822	1.064*
1995		0.683*	0.682*	0.720*	0.705*	0.425
1996		0.658*	0.654*	0.690*	0.689*	0.422
1997		0.631*	0.623*	0.656*	0.660*	0.414
1998		0.681*	0.670*	0.698*	0.701*	0.521
1999		0.716*	0.705*	0.706	0.709	0.717
2000		0.442***	0.433***	0.462***	0.464***	0.274*
2001		0.571**	0.562**	0.574**	0.576**	0.431
2002		0.633*	0.619*	0.617*	0.620*	0.549
2003		0.620**	0.608**	0.602**	0.605**	0.608
2004		0.705	0.692	0.691	0.694	0.654
2005		0.109***	0.107***	0.099***	0.100***	0.134**
Calendar year (ref: 1992) * Exposure						
1993 * Yes				1.038*		
1994 * Yes				1.219*		
1995 * Yes				0.570		
1996 * Yes				0.592		
1997 * Yes				0.624		
1998 * Yes				0.700		
1999 * Yes				0.943		
2000 * Yes				0.603		
2001 * Yes				0.810		
2002 * Yes				0.947		
2003 * Yes				1.012		
2004 * Yes				0.957		
2005 * Yes				1.454		

Previous child died during conflict years (ref: no)						
Yes	3.328*	2.623*	2.378*	2.466*	0.435	6.715***
Sex of first child (ref: male)						
Female	1.108*	1.081*	1.081*	1.079*	1.104*	0.990
Education (ref: secondary or less)						
Secondary-special	0.901	0.893	0.887	0.886	0.858	1.148
Higher	0.698**	0.752*	0.755*	0.751*	0.780	0.545
Residence type (ref: urban)						
Rural	1.652***	1.586***	1.617***	1.615***	1.585***	1.820**
Age at first birth	0.937***	0.940***	0.940***	0.940***	0.938***	0.943
σ_u^2	0.434	0.144	0.149	0.154	0.100	0.486
$\mathbf{N_{w,y}}$	8630	8630	8630	8630	7545	1085

Source: 2006 AZ-DHS. Exponentiated coefficients. Notes: Column *a* presents results for the full-sample model with the conflict indicator and controls only; Column *b* presents results for the full-sample model with calendar year and controls only; Column *c* presents results for the full-sample model with all variables; Column *d* adds an interaction term between calendar year and the exposure variable; Columns *e* and *f* present results for models with all variables for samples of each conflict group separately. $N_{w,y:}$ number of years of exposure in total analysis period for sampled women. *p<0.05, **p<0.01, ***p<0.001.

Table A2.3 Odds ratios of third birth, ever-married women

	All women				Not-exposed	Exposed
	(a)	(b)	(c)	(d)	(e)	(f)
Conflict exposure (ref: no)						
Yes	0.814		0.855	1.560		
Time since first birth (ref: <2 years)						
3-6	0.628***	0.593***	0.594***	0.592***	0.578***	0.747
7-10	0.203***	0.198***	0.198***	0.197***	0.171***	0.516
11+	0.042***	0.047***	0.047***	0.047***	0.045***	0.069***
Calendar year (ref: 1992)						
1993		1.043	1.041	1.105	1.105	0.699
1994		0.744	0.743	0.802	0.802	0.439
1995		0.738	0.738	0.793	0.795	0.452
1996		0.877	0.877	0.972	0.976	0.418*
1997		0.704	0.703	0.764	0.767	0.386
1998		0.764	0.764	0.820	0.826	0.461
1999		0.548**	0.548**	0.619	0.623	0.212*
2000		0.631*	0.633*	0.714	0.719	0.256*
2001		0.450***	0.452***	0.528**	0.534**	0.135**
2002		0.542**	0.544**	0.587*	0.595*	0.306*
2003		0.666	0.669	0.752	0.76	0.291*
2004		0.656*	0.661*	0.669	0.675	0.541
2005		0.302***	0.304***	0.299***	0.300***	0.311*
Calendar year (ref: 1992) * Exposure						
1993 * Yes				0.647		
1994 * Yes				0.543		
1995 * Yes				0.569		
1996 * Yes				0.416*		
1997 * Yes				0.512		
1998 * Yes				0.579		
1999 * Yes				0.330		
2000 * Yes				0.354		
2001 * Yes				0.251*		
2002 * Yes				0.545		
2003 * Yes				0.386		
2004 * Yes				0.806		

2005 * Yes				0.949		
Second child died during conflict years (ref: no)						
Yes	14.010***	8.351***	8.330***	8.318***	7.841***	20.032***
Sex of previous children (ref: at least one male)						
Only female	1.639***	1.624***	1.622***	1.636***	1.644***	1.331
Education (ref: secondary or less)						
Secondary-special	0.856	0.841	0.848	0.843	0.832	0.914
Higher	0.784	0.793	0.788	0.783	0.727	1.556
Residence type (ref: urban)						
Rural	2.087***	2.041***	2.028***	2.022***	2.056***	1.733*
Age at second birth	0.941***	0.942***	0.942***	0.942***	0.943***	0.934*
σ_u^2	0.353	0.042	0.014	0.004	0.031	0.006
$\mathbf{N_{w,y}}$	19730	19730	19730	19730	17182	2548

Source: 2006 AZ-DHS. Exponentiated coefficients. Notes: Column *a* presents results for the full-sample model with the conflict indicator and controls only; Column *b* presents results for the full-sample model with calendar year and controls only; Column *c* presents results for the full-sample model with all variables; Column *d* adds an interaction term between calendar year and the exposure variable; Columns *e* and *f* present results for models with all variables for samples of each conflict group separately. $N_{w,y:}$ number of years of exposure in total analysis period for sampled women. *p<0.05, **p<0.01, ***p<0.001.

Table A2.4 Odds ratios of first birth by extended conflict status, ever-married women

	All women		Not-exposed	IDPs/refugees	Karabakh residents
	(a)	(b)	(c)	(d)	(e)
Conflict exposure (ref: no)					
IDPs/refugees	1.093	0.40			
Karabakh residents	1.423*	1.928			
Time since first birth (ref: <2 years)					
3-6	0.254***	0.255***	0.255***	0.363*	0.198
7-10	0.042***	0.042***	0.042***	0.075*	0.046*
11+	0.028***	0.027***	0.041***	0.022*	0.001***
Calendar year (ref: 1992)					
1993	1.682*	1.544	1.626*	2.623	1.645
1994	1.891**	1.795*	1.904**	2.675	0.607
1995	1.672	1.490	1.569	4.707	0.605
1996	1.424	1.504	1.574	1.008	0.544
1997	2.200**	2.049*	2.195*	3.845	0.243
1998	2.795***	2.656**	2.848**	4.841*	0.461
1999	1.465	1.477	1.552	2.237	0.728
2000	1.196	1.150	1.192	1.515	0.665
2001	1.238	1.075	1.110	2.269	2.100
2002	1.764*	1.609	1.698	2.624	1.162
2003	1.715	1.448	1.528	4.055	6.494
2004	1.103	1.085	1.148	0.767	3.371
2005	0.169***	0.137***	0.133***	0.563	0.103*
Calendar year (ref: 1992) * IDP/refugee					
1993 * Yes		2.779			
1994 * Yes		2.726			
1995 * Yes		5.219			
1996 * Yes		1.042			
1997 * Yes		4.413			
1998 * Yes		4.022			

1999 * Yes		1.573			
2000 * Yes		2.229			
2001 * Yes		4.213			
2002 * Yes		3.821			
2003 * Yes		6.019			
2004 * Yes		1.436			
2005 * Yes		5.670*			
Calendar year (ref: 1992) * Karabakh resident					
1993 * Yes		1.196			
1994 * Yes		0.344			
1995 * Yes		0.576			
1996 * Yes		0.378			
1997 * Yes		0.153*			
1998 * Yes		0.231			
1999 * Yes		0.489			
2000 * Yes		0.624			
2001 * Yes		1.572			
2002 * Yes		0.667			
2003 * Yes		2.608			
2004 * Yes		2.182			
2005 * Yes		1.401			
Education (ref: secondary or less)					
Secondary-special	1.163	1.181	1.145	1.772	0.349
Higher	1.504	1.516	1.402	5.133*	0.109*
Residence type (ref: urban)					
Rural	1.157	1.155	1.255	0.549	1.041
Age at marriage	1.578***	1.592***	1.570***	1.168	3.519*
Age at marriage squared	0.988***	0.988***	0.988***	0.994	0.973*
σ_u^2	2.648	2.774	3.179	0.477	3.353
$\mathbf{N_{w,y}}$	5349	5349	4650	506	103

Source: 2006 AZ-DHS. Exponentiated coefficients. $N_{w,y:}$ number of years of exposure in total analysis period for sampled women. *p<0.05, **p<0.01, ***p<0.001.

Table A2.5 Odds ratios of second birth by extended conflict status, ever-married women

	All women		Not-exposed	IDPs/refugees	Karabakh residents
	(a)	(b)	(c)	(d)	(e)
Conflict exposure (ref: no)					
IDPs/refugees	1.411**	1.570*			
Karabakh residents	1.447***	3.366*			
Time since first birth (ref: <2 years)					
3-6	0.463***	0.463***	0.438***	0.937	0.370
7-10	0.104***	0.103***	0.099***	0.285	1.001
11+	0.013***	0.013***	0.014***	0.007**	0.119
Calendar year (ref: 1992)					
1993	0.819	0.871	0.851	1.048*	1.067*
1994	0.847	0.833	0.822	1.112*	1.026*
1995	0.682*	0.721*	0.705*	0.367	0.563
1996	0.654*	0.690*	0.689*	0.441	0.185
1997	0.623*	0.657*	0.660*	0.411	0.272*
1998	0.670*	0.698*	0.701*	0.481	0.659
1999	0.705*	0.707	0.709	0.702	0.713
2000	0.433***	0.462***	0.464***	0.285	0.119**
2001	0.562**	0.574**	0.576**	0.463	0.155*
2002	0.619*	0.617*	0.620*	0.542	0.369
2003	0.608**	0.602**	0.605**	0.704	0.175*
2004	0.692	0.691	0.694	0.760	0.171**
2005	0.107***	0.099***	0.100***	0.124**	0.120**
Calendar year (ref: 1992) * IDP/refugee					
1993 * Yes		1.042*			
1994 * Yes		1.080*			
1995 * Yes		0.518			
1996 * Yes		0.654			
1997 * Yes		0.674			
1998 * Yes		0.693			
1999 * Yes		0.995			
2000 * Yes		0.685			
2001 * Yes		0.960			

2002 * Yes		1.017			
2003 * Yes		1.266			
2004 * Yes		1.244			
2005 * Yes		1.482			
Calendar year (ref: 1992) * Karabakh resident					
1993 * Yes		1.022*			
1994 * Yes		1.058*			
1995 * Yes		0.785			
1996 * Yes		0.308			
1997 * Yes		0.381			
1998 * Yes		0.713			
1999 * Yes		0.709			
2000 * Yes		0.268*			
2001 * Yes		0.278			
2002 * Yes		0.563			
2003 * Yes		0.288*			
2004 * Yes		0.251**			
2005 * Yes		1.067			
First child died during conflict years (ref: no)					
Yes	2.381*	2.485*	0.435	8.251***	0.683
Sex of first child (ref: ale)					
Female	1.081*	1.076*	1.104*	0.931	1.069
Education (ref: secondary or less)					
Secondary-special	0.887	0.887	0.858	1.142	1.483
Higher	0.755*	0.751*	0.780	0.532	0.470
Residence type (ref: urban)					
Rural	1.615***	1.613***	1.585***	2.123*	1.496
Age at first birth	0.940***	0.939***	0.938***	0.970	0.886*
σ_u^2	0.149		0.100	0.498	0.357
$\mathbf{N_{w,y}}$	8630	8630	7545	753	332

Source: 2006 AZ-DHS. Exponentiated coefficients. $N_{w,y:}$ number of years of exposure in total analysis period for sampled women. *p<0.05, **p<0.01, ***p<0.001.

Table A2.6 Odds ratios of third birth by extended conflict status, ever-married women

	All women		Not-exposed	IDPs/refugees	Karabakh residents
	(a)	(b)	(c)	(d)	(e)
Conflict exposure (ref: no)					
IDPs/refugees	0.802	1.628			
Karabakh residents	1.071	1.335			
Time since first birth (ref: <2 years)					
3-6	0.594***	0.593***	0.578***	0.893	0.552
7-10	0.197***	0.197***	0.171***	0.671	0.230**
11+	0.047***	0.047***	0.045***	0.056**	0.120*
Calendar year (ref: 1992)					
1993	1.041	1.105	1.105	0.658	0.914
1994	0.744	0.802	0.802	0.330	1.040
1995	0.739	0.794	0.795	0.315	1.138
1996	0.878	0.972	0.976	0.338*	0.858
1997	0.704	0.764	0.767	0.345	0.547
1998	0.765	0.82	0.826	0.385	0.805
1999	0.549**	0.62	0.623	0.199*	0.294
2000	0.635*	0.714	0.719	0.256	0.283
2001	0.453***	0.528**	0.534**	0.116*	0.243
2002	0.545**	0.588*	0.595*	0.272	0.488
2003	0.670	0.752	0.760	0.196*	0.849
2004	0.663*	0.671	0.675	0.606	0.456
2005	0.306***	0.300***	0.300***	0.395	0.120
Calendar year (ref: 1992) * IDP/refugee					
1993 * Yes		0.618			
1994 * Yes		0.422			
1995 * Yes		0.430			
1996 * Yes		0.340			
1997 * Yes		0.482			
1998 * Yes		0.505			
1999 * Yes		0.304			
2000 * Yes		0.342			
2001 * Yes		0.207			
2002 * Yes		0.484			

2003 * Yes		0.247*			
2004 * Yes		0.824			
2005 * Yes		1.030			
Calendar year (ref: 1992) * Karabakh resident					
1993 * Yes		0.756			
1994 * Yes		1.163			
1995 * Yes		1.313			
1996 * Yes		0.795			
1997 * Yes		0.635			
1998 * Yes		0.929			
1999 * Yes		0.453			
2000 * Yes		0.393			
2001 * Yes		0.470			
2002 * Yes		0.829			
2003 * Yes		1.116			
2004 * Yes		0.673			
2005 * Yes		0.396			
Second child died during conflict years (ref: no)					
Yes	8.310***	8.357***	7.841***	35.310***	10.396
Sex of previous children (ref: at least one male)					
Only female	1.622***	1.634***	1.644***	1.206	2.030
Education (ref: secondary or less)					
Secondary-special	0.848	0.842	0.832	0.992	0.575
Higher	0.788	0.779	0.727	1.506	1.977
Residence type (ref: urban)					
Rural	2.000***	1.992***	2.056***	1.274	1.420
Age at second birth	0.942***	0.941***	0.943***	0.918	0.955
σ_u^2	0.073	0.021	0.031	0.019	0.340
$\mathbf{N_{w,y}}$	19730	19730	17182	2196	352

Source: 2006 AZ-DHS. Exponentiated coefficients. $N_{w,y:}$ number of years of exposure in total analysis period for sampled women. *p<0.05, **p<0.01, ***p<0.001.

2.11 Appendix B

Table B2.1 Odds ratios of first, second and third birth by conflict status (narrow definition)

	1st birth	2nd birth	3rd birth
Conflict exposure - narrow definition (ref: not exposed)			
Yes	1.185	1.421***	0.852
Time since first birth (ref: <2 years)			
3-6	0.254***	0.463***	0.594***
7-10	0.042***	0.104***	0.198***
11+	0.028***	0.013***	0.047***
Calendar year (ref: 1992)			
1993	1.683*	0.819	1.041
1994	1.892**	0.848	0.743
1995	1.674	0.683*	0.738
1996	1.426	0.655*	0.876
1997	2.203**	0.626*	0.703
1998	2.802***	0.673*	0.763
1999	1.467	0.709*	0.547**
2000	1.199	0.435***	0.632*
2001	1.239	0.563**	0.451***
2002	1.765*	0.621*	0.542**
2003	1.715	0.609**	0.668
2004	1.105	0.693	0.660*
2005	0.170***	0.107***	0.304***
First child died during conflict years (ref: no)			
Yes		2.570*	
Sex of first child (ref: male)			
Female		1.083*	
Second child died during conflict years (ref: no)			
Yes			8.298***
Sex of previous children (ref: at least one male)			
Only female			1.615***
Education (ref: secondary or less)			
Secondary-special	1.167	0.888	0.846
Higher	1.510	0.756*	0.786
Residence type (ref: urban)			
Rural	1.171	1.610***	2.030***
Age at marriage	1.577***		
Age at marriage squared	0.988***		
Age at first birth		0.940***	
Age at second birth			0.942***
σ_u^2	2.643	0.149	0.015
$\mathbf{N_{w,y}}$	5349	8630	19730

Source: 2006 AZ-DHS. Exponentiated coefficients. $N_{w,y:}$ number of years of exposure in total analysis period for sampled women. Note that models including an interaction term between calendar year and the conflict exposure measure are not shown for space constraints (see note 32). *p<0.05, **p<0.01, ***p<0.001.

Chapter 3

Armed conflict and female teen marriage in Azerbaijan*

3.1 Introduction

There are at least three reasons why demographers and policymakers should be concerned with whether armed violence affects early union formation. The first relates to the scale of the issue: globally, over 650 million women alive today – or 1 in 5 – are estimated to have married in adolescence, and the highest rates of teen unions, i.e., marriages involving girls aged 12-19, are in countries with great levels of political violence (UNICEF 2020, 2013). With a growing number of people and children living in conflict-torn contexts, the issue evidently has the potential to impact the lives of increasingly many girls and families worldwide (Østby et al. 2020; UNOCHA 2019). Second, early marriage is a violation of the Universal Declaration of Human Rights bearing profound and lasting consequences on individuals, e.g., educational and socio-economic disadvantage (Dahl 2010; Lyngstad 2006), poor pregnancy outcomes and higher maternal mortality (Ganchimeg et al. 2014; Nove et al. 2014), domestic abuse and union dissolution (Kiplesund and Morton 2014; Teachman 2002), and implications for future generations and other aspects of social life, including gender equality and public health (Nour et al. 2006; UNICEF 2005). Situations of armed violence exacerbate these human and social costs (Mazurana et al. 2019). Third, in many LMICs, shifts in union formation

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are strongly tied to changes in the timing of childbearing, future fertility patterns and long-term population dynamics. If women marry sooner, ceteris paribus, reasonably, their life-time fertility will raise and contribute to population growth (Onagoruwa and Wodon 2018). Anticipating similar scenarios is key for post-conflict reconstruction strategies, development and resource allocation (Duflo 2005; Thiede et al. 2020).

However, demographic research on the relationship between armed violence and teen marriage is remarkably scarce. This study addresses this lacuna. Specifically, it examines whether women in Azerbaijan who were affected by the Nagorno-Karabakh conflict with Armenia and reached their teens in its climax years (1992-1996) had different early marriage trajectories compared to their non-affected peers and to women who were 'at risk' of teen union in the pre-conflict Soviet era.

In theory, the relationship could go either way. War may promote early unions through mechanisms that include the search for economic and/or physical security for girls and their families, nationalist pro-natalist policies and reinforced gender roles (Neal et al. 2016). Alternatively, armed conflict could induce families to postpone the marriages of their young daughters because of financial hardship, forced migration and disrupted social networks, among others (Shemyakina 2013; Staveteig 2011). The extent of these competing scenarios further depends on pre-existing trends in marital timing and women's ages at conflict occurrence (Neal et al. 2016).

Net of a recent mixed-methods study on early marriage practices among Syrian refugees in Jordan (Sieverding et al. 2020), quantitative research so far considered overall marriage patterns only, and yielded inconclusive answers with regards to the sign, and even the actual presence of a relationship (e.g., Jayaraman et al. 2009; Khawaja and Randall 2006; Shemyakina 2013; Valente 2011). Inasmuch as this literature provides valuable contributions, the focus on general marriage outcomes overlooks the particular vulnerabilities of young population segments in conflict. Further, most of this evidence relies on time-trend comparisons and rarely do studies deal with conflict-related migration.

To tackle these issues, I use data from the 2006 Azerbaijan Demographic and Health Survey and conflict information from the Uppsala Conflict Data Program. I estimate survival models specified

with a difference-in-difference logic that exploits data on forced displacement, spatial variation in conflict violence and a cohort specification that accounts for the risk of marrying in teen ages before and during the war. The results provide evidence of a significant and robust negative relationship between conflict, its intensity and frequency, and teen union formation. The largest reductions characterise the cohorts who spent most of their teens under active conflict conditions. Further, findings on response heterogeneity by conflict-related migration suggest displacement as a plausible driver of the lower early marriage levels of these cohorts.

This paper makes a unique contribution to the literature on households' demographic responses to war and socio-economic turmoil as the first to provide empirical evidence directly on teen marriage. Moreover, unlike other accounts of the demographic consequences of armed violence, the available data and peculiar characteristics of the Nagorno-Karabakh conflict allow to explicitly handle and examine forced migration. Albeit findings cannot be interpreted strictly as causal, the use of a design strategy seeking to isolate as much as possible the impact of conflict represents another improvement to the relatively narrow methodological approaches used until now. The study context is also highly pertinent to the research purpose. Since its independence and the onset of the dispute with Armenia, Azerbaijan has reported an increasingly large share of marriages involving teenagers (Azerbaijan SSC 2011b), and today it has one of the highest rates of adolescent union in Eurasia (UNFPA 2012, 2014). Differently from the other handful of settings studied previously (e.g., Rwanda or Tajikistan), where conflicts reached a peaceful settlement, Azerbaijan's case also allows investigating the issue in relation to a conflict that was officially "frozen" until 2020 (Cornell 2017), when violence re-escalated. The findings are thus of tangible interest for policy in Azerbaijan, and in other turbulent settings where unsettled conflicts have begun to evolve into similar simmering dynamics.

3.2 Armed conflict and teen unions: pathways and factors

Despite growing political and programmatic attention to early unions and women's vulnerabilities in conflict, knowledge about the influence of armed violence on female adolescent marriage is largely limited to qualitative studies, which tend to suggest conflict-related increases (Kohno et al. 2020;

Mourtada et al. 2017; Schlecht et al. 2013). Quantitative research assessing the magnitude and drivers – or even just confirming the existence and direction of the relationship at the population-level – is scarce (Neal et al. 2016). To date, only Sieverding et al. (2020)'s mixed-methods study on Syrian refugees in Jordan examined changes in early marriage associated with armed conflict with solid statistical analyses, finding no evidence of increases.

A handful more studies have at least focused on population-level changes in general marriage patterns associated with conflict, offering mixed results. Some of these analyses document declines in union formation in wartime. For example, Khawaja and Randall (2006) and Saxena et al. (2004) found decreasing marriage rates during the second Palestinian Intifada and the Lebanese civil war, respectively. In both cases, the declines occurred for most women, including girls aged 15-19. Union postponement was also observed during the Bosnian war (Staveteig 2011), the Rwandan genocide (Jayaraman et al. 2009; Verpoorten and Schindler 2012) and, at least temporarily, in Cambodia under the Khmer Rouge regime (De Walque 2006). In the one study on a former Soviet context most similar to Azerbaijan, Shemyakina (2013) showed that women in conflict-stricken areas who attained marriage age during or just after Tajikistan's civil war were less likely to marry than their non-affected counterparts.

However, other analyses report conflict-related marriage increases, even in the same contexts of some of the studies introduced above. For instance, both Staveteig (2011) and Clifford et al. (2010) noted a faster entry into marriage, especially for young women, during the Rwandan and Tajik conflicts. The discordance in findings is due to different methodologies: while Staveteig (2011) and Clifford et al. (2010) analysed only temporal changes in trends within the whole population, Jayaraman et al. (2009), Verpoorten and Schindler (2012) and Shemyakina (2013) relied on more advanced statistical techniques and, importantly, sought to identify war-affected women. Marriage increases were though also documented in research using finer measures of conflict exposure in Nepal (Valente 2011; Williams et al. 2012), and in a study on displaced Malian Tuareg (Randall 2005).

Results from these studies are evidently not univocal, presumably because of different methodologies and limited attention to age-groups, sub-populations (e.g., displaced), and the impact of secular shifts or other simultaneous factors. Yet, by connecting their findings with existing conceptual frameworks on marital timing, including cost-benefit models (Becker 1981), economic resource theory (Corno et al. 2020) and marital search models (Oppenheimer 1988), sociological and life-course perspectives, it may be possible to guide expectations specific to teen unions, and advance suggestions on explanatory pathways.

First, classic cost-benefit marriage models may explain conflict-related increases in adolescent unions (Randall 2005; Valente 2011). In times of crisis, marriage may be perceived as a 'consumption-smoothing' tool generating economies of scale, and thus useful to pool scarce resources and share risk (Fussel and Palloni 2004; Rosenzweig and Stark 1989), especially where bride-price is customary (Corno et al. 2020). Since also a substantial number of studies in economics and psychology suggests greater risk-aversion in war-affected individuals (Bellucci et al. 2020; Callen et al. 2014), we may expect conflict-stricken households to opt for early "transactional" marriages to secure financial support for their young daughters, offload family economic responsibilities and extend networks (UNICEF 2013; Hoogeveen et al. 2011). If conflict hits schooling infrastructures hard, resulting in the permanent drop-out of young cohorts, this alternative may be especially true for the youngest and lowest-educated girls (Cetorelli 2014).

The costs associated with marriage may though elicit the opposite response: as economic conditions deteriorate, employment and housing options become scant or inadequate (Saxena et al. 2004), conflict-affected families may divert spending from the payment of ceremonies to more immediate needs, e.g., health and re-location expenses, at least in the short-term, or may be unable to afford good-sized dowries (Khawaja and Randall 2006), leading to expect the postponement of unions that would otherwise occur in early ages (Corno et al. 2020).

In addition to economic uncertainty, war brings about physical risks to which girls are particularly vulnerable, and that could increase their marriage risk. Households may expedite marriages to protect

girls and their honour from forms of physical harm like rape or abductions (Randall 2005; Sieverding et al. 2020). At the same time, the hunt for physical safety often entails forced migration. Displacement can split existing couples, delay already organised marriages or disrupt social networks functional for finding partners (Hutchinson et al. 2016; Crawford et al. 2015). From a cohort perspective, the disruption of social networks seems particularly relevant for girls in their early teens when displaced, given that early unions are often facilitated by parental social connections in the local community (Schaffnit et al. 2019) and/or rely on consanguineous (kin) relationships (Sieverding et al. 2020). Reduced chances to marry may also be hypothesised for girls whose physical security is violated during conflicts. For instance, those maimed, injured or raped may be perceived as "less desirable" by potential grooms or may themselves be reluctant to search for partners following conflict trauma (Staveteig 2011).

Marital search models may further suggest war-induced changes in girls' marital trajectories resulting from variations in sex-ratio and shortages of men (Warner et al. 2011). If individuals look for partners in specific areas, and the likelihood of union formation is highest when there is plenty of potential mates, mass mobilisation and excess mortality among young men may reduce the availability of suitable partners, leading to marriage declines (De Walque 2006). Alternatively, sex-ratio imbalances could increase the prevalence of informal or polygamous unions as young unmarried women look for sources of support (Staveteig 2011). Though, in the study setting most akin to Azerbaijan, Shemyakina (2013) finds no relationship between variation in local sex-ratios during Tajikistan's war and female age at marriage.

It is also plausible to expect war-induced broad structural changes, including shifting gender dynamics, rising nationalism and the break-down of social cohesion, to alter girls' marital timing (Neal et al. 2016). Sociological research for example suggests that young women's increased participation in non-traditional roles, e.g., in the workforce or the battlefield, may result in empowerment gains and greater control over life choices, including the deliberate decision to delay marriages (McKay and Mazurana 2004; Etchart and Baksh-Soodeen 2005). Alternatively, conflict may reinforce stereotypical gender attitudes and elevate the expectation of female domesticity.

Together with pro-natalist narratives encouraging the "need" to maintain a demographic balance with the enemy and "compensate for" conflict losses, these expectations may expose girls to higher social pressure to marry (Staveteig 2011; Chi et al. 2015). Moreover, war impinges on social embeddedness, i.e., the breadth, depth and extent of social cohesion within a community (Takács 2005). Resultant reduced social trust can complicate the search for partners, notably in intrastate conflicts (Cassar et al. 2013) and in traditional societies where kin and intra-community are usually harnessed to arrange weddings (Jayaraman et al. 2009).

Finally, the consequences of macro-level events, including war, are known to vary depending on one's birth cohort (e.g., O'Brein 2020; London and Wilmoth 2016). Hence, a nontrivial, yet so far neglected aspect relates to the life-stages, and thus ages when girls experience conflict (Neal et al. 2016). From this cohort or life-course perspective, it seems reasonable to expect conflict-related marriage changes, especially for girls in their early teens at conflict onset. Compared to younger children (who may turn teens as the war continues), these girls seemingly would have already reached menarche and would be considered 'marriageable' (Ibitoye et al. 2017). Moreover, the fact that this group would spend most, if not all its time 'at risk' of adolescent marriage under conflict conditions (while older teens would face a shorter 'eligibility' window) would make experiencing war at this life-stage particularly impactful.

Evidently, the impact of conflict on union dynamics is more complex than it may appear at first: not only there is theoretical and empirical ambiguity on the drivers; even the sign of the relationship is unclear (Neal et al. 2016). For teen unions specifically, although it is plausible to expect armed conflict to alter risk, current knowledge does not allow generating clear *a priori* hypotheses about which direction this shift may take as the relationship can go either way. It is also unknown whether war at specific early-life-stages and the type of conflict experience trigger different responses. The overarching aim here is therefore to determine as neatly as possible whether conflict, in its spectrum of manifestations, is actually associated with teen union. Then only, to examine specificities, including conflict intensity and frequency, differences by ages during conflict and experiences of displacement, which may be informative of explanatory processes.

3.3 The study setting

3.3.1 Post-Soviet Azerbaijan: socio-economic changes and the conflict with Armenia

Significant financial deterioration and instability characterised Azerbaijan's post-Soviet path to regime change (Singh and Laurila 2011; World Bank 2005). The transition period was further complicated by the outbreak of conflict violence with Armenia over Nagorno-Karabakh, a mountainous region officially recognised as part of Azerbaijan (UN Security Council 1993a-d; UNGA 2008), but which Armenia regards as an Armenian historical area of residence (HRW 1994; Cornell 2001; Armenia Ministry of Foreign Affairs 2020).[1]

The conflict traces its roots to the last years of the USSR and its structural arrangements. During the Soviet era, the region was granted an autonomous status – the Nagorno-Karabakh Autonomous Oblast (NKAO) – within the then Azerbaijan Soviet Socialist Republic, but its borders contained a sizable Armenian population (Demoscope Weekly 2016; de Waal 2004). When the Soviet centre-dominated control system crumbled, tensions mounted in NKAO and demonstrations reclaiming Nagorno-Karabakh's membership to Armenia extended from Stepanakert/Khankendi (the capital of NKAO) to Yerevan (de Waal 2004). Violent rallies causing casualties took place also around Baku.

Confrontational politics turned into outright conflict in December 1991 when, with Armenian support, NKAO proclaimed independence from Azerbaijan (HRW 1992, 1994). Although disagreement between sources exists on the exact start and end dates of the hostilities, most analysts and official sources indicate early 1992 as the beginning of the full-blown war, 1992-1994 as its most violent period (Figure 1.2, Introduction), and the post-1994 armistice years (1995-1996) as a 'cooling-off' phase still characterised by instability, attacks on civilians and conflict-related population movements (CSCE 2012; ICG 2005; Cornell 2001, 2015; de Waal 2004; Hopmann and Zartman 2010; Krüger 2010; HRW 1992, 1994; Huseynov 2010).

[1] This section seeks to summarise as neutrally as possible the conflict's chronological developments using available official sources and documents. In no way I compare human rights violations on either sides or suggest any specific stance on the dispute.

Since then, the conflict has been described as "frozen" (Cornell 2017; Grant 2017). The resultant *de facto* Republic of Nagorno-Karabakh (also known as Artsakh), the Western parts of three other officially Azerbaijani districts (Agdam, Fizuli and Terter) and the region of Kelbajar-Lachin became entirely populated and controlled by ethnic Armenians. Altogether these territories comprise approximately 20% of Azerbaijan's internationally recognised territory (Racz 2016). Only the Eastern segments of Agdam, Fizuli and Terter remained under Azerbaijan's jurisdiction as parts of what, in Azeri language, is known as the Upper-Karabakh (Yukhari-Karabakh) region (UN Security Council 1993a-d).

An estimated 17,000-25,000 Azerbaijani died in the conflict (Cornell 2015; de Waal 2004; Yunusov 2002). No official or consolidated gender/age-disaggregated estimate is available either for civilian or military deaths. However, some evidence suggests that the killing of civilians and other atrocities, like rape and torture, occurred indiscriminately on both sides, and that Azerbaijani military losses were predominantly males (Amnesty International 1993; HRW 1994; UNDP 2007; Azerbaijan SSC 2021).[2] The conflict further imbued an already patriarchal society with a nationalist rhetoric celebrating male fighters as heroic "martyrs" and valuing women for their roles of wives and mothers of future defenders (Twum et al. 2019).

Antagonistic nationalism was fuelled by the plight of displacement. The conflict caused the mass expulsion of all ethnic Azerbaijani from Armenia and Nagorno-Karabakh (Yunusov 2002). Although exact numbers are contested, over 750,000 Azerbaijani – seemingly equally divided by gender (UNHCR 2009) – had to relocate to safer areas within Azerbaijan and were granted *prima facie* IDP/refugee status (UNHCR 2003, 2009). Because of this heavy inflow, about 10-15% of the country's then total population of 8 million, for years Azerbaijan was the country with the largest per capita number of IDPs in its national population (Greenway; 2009 UNHCR 2009). As of 2016, one in 15 Azerbaijani was still displaced and none lived in Nagorno-Karabakh (UNHCR 2017).

[2] According to the only source (in Russian) citing women's involvement in direct combat, around 100 female soldiers fought in the conflict (Oganian and Mkhitarian 2001: p.246). It is unclear whether the figure includes Armenian-Karabakhi women only or also ethnic Azerbaijani. Differently from male deaths, killed or injured women in this conflict have been described as "invisible victims" (Twum et al. 2019).

3.3.2 Marriage traditions and early unions in Azerbaijan

Marriages are central to Azerbaijani culture, and have important socio-economic functions (Tohidi 1999). The formalisation of unions involves large spending for celebrations and expensive financial transactions, including the dowry paid by the bride's family (*cəhiz*), the bride payment made by the groom (*başlığ*) and other inter-families material exchanges. This borrowing and lending of currency and assets then serves to enact social status and expand networks (Yalçın-Heckmann 2001).

For these reasons, and the social stigmatisation of late marriages or singlehood, early marriages were common in pre-Soviet Azerbaijan (Havilov 1991; UN Azerbaijan 2015). In the Soviet period, however, rates declined sharply thanks to several measures targeting Islamic and customary marriage practices, including bans on child marriage, polygamy, arbitrary divorce, and to mandatory schooling for women (Edgar 2006; Heyat 2014; Lapidus 1978).

Since independence in 1991, and even after the 1995 legal prohibition to contract marriage before 18, official figures have reported an increasing share of marriages involving adolescents (Azerbaijan SSC 2011b). These numbers are likely an undercount since official statistics only include marriages registered at State agencies, whereas unions involving adolescents tend to be first celebrated with unofficial religious ceremonies (*khebin*) and formally registered once the youngest spouse (typically the bride) reaches the legal marriageable age (UNFPA 2014).

3.4 Data and measures

3.4.1 Data

The primary data source for analysis is the 2006 Azerbaijan Demographic and Health Survey (AZ-DHS), which collected various demographic, family and conflict-related information from a nationally representative sample of Azerbaijani women aged 15–49 years.[3] As explained in the previous Chapter, the sample was generated in two stages: clusters were first selected in Baku and

[3] 94% of sampled women were ethic Azerbaijani and 99% spoke Azerbaijani as native language (Table B3.1).

the other administrative units of Azerbaijan using the 1999 Population Census as a sampling frame. Households were then listed in each cluster and systematically selected, with an overall response rate of 98%. For security reasons, the sample excluded the Nakhchivan exclave and, due to their contested status, the Kelbajar-Lachin economic region and the Western parts of Agdam, Fizuli and Terter (Figure 3.1). In 2006, these latter were *de facto* controlled and only populated by ethnic Armenians (Nagorno-Karabakh National Statistical Service 2006), not the focus of this paper.

The second data source I employ is the UCDP-GED (2022), which openly provides worldwide spatial and chronological coordinates on conflict episodes and casualties (Croicu and Sundberg 2016). Its data is widely used in research and judged to be of the highest quality available for this study's aims (Eck 2012).

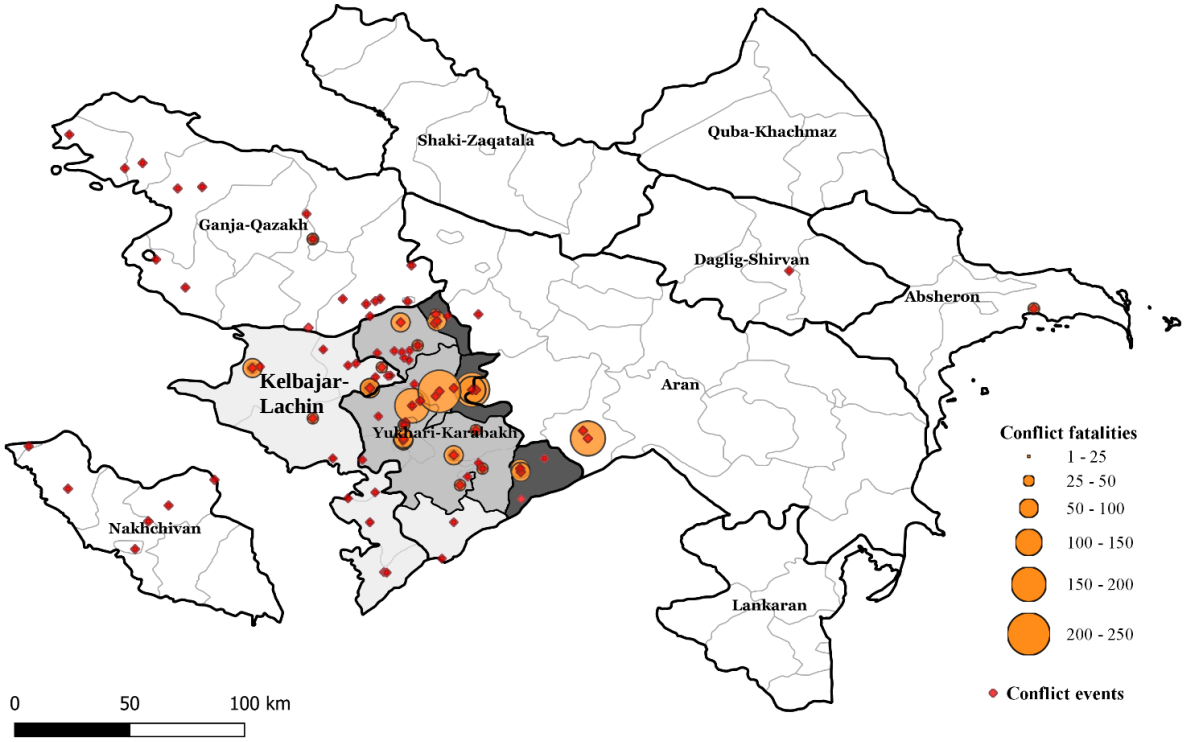
3.4.2 Variables

Information on the timing of marriage comes from the AZ-DHS women's questionnaire, which asks respondents: "*In what month and year did you start living with your (first) husband/partner as if married*?". Since weddings involving adolescents can go unregistered until spouses grow older, the AZ-DHS employs this wording to effectively capture women's date of marriage rather than its registration. I use this question to construct my dependent variable and analyse 'survival' time to teen marriage. Drawing from international definitions and past empirical studies (Dahl 2010; WHO 2010; UNICEF 2020), teen marriage is defined as unions involving girls aged 12–19. Other individual-level socio-demographic information, including year of birth, residence location/type, also come from the AZ-DHS.

I construct several variables to identify women affected by the war, and thus to determine changes in teen union associated with conflict. The first is a cohort-level measure, coded as one for the cohorts turning 12–19 during the conflict because these women were 'at risk' of teen union in wartime. The second measures overall conflict-exposure, combining information on self-reported displacement status and residence in conflict-stricken districts in Upper-Karabakh. This indicator is intended to capture women's conflict experiences in their spectrum of manifestations. Finally, using UCDP-GED

data, I construct two supplementary continuous variables that help delve into the relationship with war intensity and frequency. Table A3.1 (Appendix A) summarises these variables and their mutual relationships. Each is described in detail below.

Figure 3.1 Map of conflict events and fatalities in Azerbaijan 1992-1996



Source: UCDP-GED (2022). Notes: The map shows the 9 economic regions of mainland Azerbaijan (66 districts) and the exclave of Nakhchivan (non-sampled). The non-sampled Jabrail districts and Kelbajar-Lachin region are highlighted in light grey; the *de facto* Republic of Nagorno-Karabakh (Artsakh), and the sampled parts of the contested districts of Agdam, Terter and Fizuli (Upper-Karabakh) are respectively in progressively darker grey. Red diamonds conflict events. Larger orange dots denote increasingly high number of conflict fatalities as measured by UCDP-GED best-estimate. Multiple conflict events occurred in the same location, so red dots sometimes overlap. All conflict events displayed on the map took place between 1992–1996. All conflict events in the non-sampled exclave of Nakhichevan occurred in 1992 and were coded by UCDP-GED as: "State-based violence between Side A: Government of Azerbaijan and Side B: Republic of Artsakh".

3.4.2.1 Cohort-level exposure to conflict

The first conflict measure is based on women's ages in wartime, and thus on birth cohort. Since the conflict could have only influenced the teen marriage decisions of those aged 19 and below at its onset, I generate a cohort variable based on women's entry into/exit from the pool of marriageable

adolescents and their ages between 1992-1996 (Shemyakina 2010; O'Brein 2020). Table A3.2 (Appendix A) identifies relevant cohorts by showing women's age at conflict onset (1992), after it peaked and ended (1996), the year in which they 'started' (turned 12) and 'ceased' (turned 19) to be eligible for teen union, and their age at survey time. Figure A3.1 (Appendix A) shows akin information in a corresponding Lexis graph format.

Women aged 21+ at conflict onset (born 1957-1971) were teenagers before the war and the USSR dissolution, hence they were too old to have their teen marriage outcomes influenced by the conflict. I call this group the "*Soviet cohort*". Conversely, women who turned 12-19 between 1992-1996 (born 1974-1984) were 'at risk' of teen marriage during the peak conflict years. I define this group as the "*War-cohort*".

Later, I further disaggregate this latter group into women who spent their late (born 1974-1977), almost entire (1978-1980) or early (1981-1984) teens under conflict to examine differences across early-life-stages.

3.4.2.2 Overall conflict-exposure indicator

The second measure – the overall conflict-exposure indicator[4] – is constructed by combining three groups of conflict-affected women into a single binary variable. Specifically, I exploit their location when the conflict began, which I can retrace with the AZ-DHS in spite of the absence of full migration histories.

First, unlike most household surveys, the AZ-DHS asks all respondents aged 16+ two separate questions about IDP/refugee status.[5] If an interviewee identifies as a refugee or IDP from Nagorno-Karabakh, s/he is then asked about the country or district s/he moved from as a result. These questions permit the identification of a first conflict-affected group: Azerbaijani women who lived in Armenia or Nagorno-Karabakh when the conflict erupted, and who also experienced resultant forced displacement.

[4] Note that throughout this Chapter, I use the terms conflict-exposed and conflict-affected interchangeably.
[5] Specifically: "Is [NAME] an internally displaced person?" and "Is [NAME] a refugee?".

Second, the questionnaire asks about years lived in the current place of residence. I use this information to identify a second group of conflict-affected respondents: women who always resided (or migrated pre-conflict, i.e., before 1992) in the Upper-Karabakh region, namely in Azerbaijan-controlled and sampled areas of Agdam, Fizuli and Terter. These women were not forced out of their territories and, perhaps, their specific villages did not suffer from major disruptions. However, these women were still affected by conflict events (Figure 3.1). Importantly, due to residential proximity to the core conflict zones and the contested status of their districts, these women likely faced recurring indirect exposure and subtle conflict-related insecurities (e.g., fear of coercive acts, land expropriation), with potential consequences for family-related decision-making. This group also includes a few non-IDP/refugee women (*n*=54) who migrated to these districts during conflict years.

Lastly, I identify a third group: non-refugee/IDP women with at least one male member of their natal household (e.g., father, brother) or the mother, if she was the household head, who declared being displaced by the war. In the initial phase of the exodus, indirect registration costs (e.g., travel to registration points) were presumably high, while food allowances were granted to families provided that their head was a registered IDP/refugee (ICG 2012; Kalin et al. 2009; UNHCR 2009). Although the survey was implemented sufficiently after to make up for any initial under-registration and Azerbaijan's government granted practically universal protection to citizens fleeing the conflict, the above reasons still do not exclude that some conflict-affected women went unregistered (and hence unreported). This coding procedure tackles this potential source of underreporting.[6]

By combining women affected by the conflict both directly (experienced violence and its ramifications like forced displacement) and indirectly (through physical proximity, or having conflict-affected family members), the *overall conflict-exposure* indicator serves as a starting point and measures the experience of conflict in its possible manifestations. In subsequent analyses, I separate its specific components to learn about potential heterogeneity, including differences by

[6] Evidently, this strategy captures only any underreporting of women living with their origin, conflict-affected families in 2006, not those living outside (e.g., with partners). While I cannot rule this out, evidence suggests that even when IDP women marry non-IDP men, they rarely forgo their status because of its associated social protection benefits, and allegedly as a preventative measure against divorce (ICG 2005).

displacement status.

3.4.2.3 Conflict intensity and frequency indicators

I complement the discrete indicator with two supplementary continuous variables for frequency and intensity of conflict, using UCDP-GED event and fatality data.

Several studies examining conflict effects on other outcomes exploit the UCDP-GED georeferenced nature and link the dataset directly with geolocated survey clusters (e.g., Østby 2020). Unfortunately, the AZ-DHS did not gather fine-grained GIS cluster data that would allow similar procedures and only provides numerical information on women's current district of residence. Therefore, we know their economic region of residence (e.g., Aran, Absheron), but only the numeric code of their specific district in that region.[7] However, the AZ-DHS allows tracing back IDPs' origin district before they fled Nagorno-Karabakh. We also know that women in Upper-Karabakh resided in the sampled parts of either Agdam, Fizuli or Terter. I thus creatively exploit UCDP-GED data and link them to the groups used to construct the binary indicator.[8]

I do so in a sequential manner. First, I map the exact location of all conflict events and related fatalities that occurred between January 1992-December 1996 as recorded by the UCPD-GED. About 81% of events (red dots in Figure 3.1) and almost all casualties (orange dots) occurred in Agdam, Fizuli and Terter or in areas characterised by complete forced migration (Nagorno-Karabakh and Kelbajar-Lachin, thereby allowing to capture conflict intensity and frequency with a good degree of accuracy. Second, I calculate the district-level number of conflict episodes (*frequency*) and fatalities per 1,000 population as per the 1989 USSR Population Census (*intensity*) between 1992-1996. Third, I match the computed values to the groups earlier identified as "conflict-exposed".

Based on their origin district in Nagorno-Karabakh, I assign the specific district-level values of each continuous indicator to IDP women (and to women with an IDP/refugee household member as

[7] As noted earlier, it was not possible to obtain a list of district names matching numerical codes due to confidentiality.
[8] The inclusion of these indicators is an advancement compared to the sole discrete indicators used in Chapter 2. It reflects the increase in my own knowledge of conflict measurement and the improvements that occurred in the literature during my doctoral years.

described above). I assign to refugees from Armenia the average value of conflict events and deaths that occurred across all districts in Nagorno-Karabakh because we do not know where these women lived in Armenia and hence the exact extent of violence they experienced there. The values are similar to the number of conflict episodes and fatalities that occurred across conflict-affected districts of Armenia. Finally, permanent residents of Upper-Karabakh districts (Agdam, Fizuli, Terter) are assigned averages of conflict events and fatalities that occurred in these three districts between 1992-1996. For the few women who migrated to these districts during the conflict, I calculate the same measures, but starting with the year they arrived rather than 1992. For instance, the mean number of conflict events across the three districts in Upper-Karabakh was 13 between 1993-1996 and 9 between 1994-1996. If a woman moved to these districts in 1993, she is considered exposed to 13 events; to 9 if she moved in 1994. All other women, including non-IDP/refugees in districts affected by some conflict events in otherwise relatively peaceful regions, e.g., Ganja-Qazakh, are considered as affected by no events/fatalities. I address this potential measurement error in the robustness checks.

3.5 Empirical strategy

To study the relationship between conflict and teen marriage, I estimate complementary log-log (clog-log) survival models. These are here preferred to standard OLS regressions because of the time-to-event nature of the outcome variable and because they allow accounting for censoring of the observations and exit from the risk-set at different times for each subject. Further, I chose a clog-log link function because the survey records duration data in discrete units, and the probability of the event is small. The clog-log model is also the discrete-time analogue of a proportional hazard model and thus coefficients, once exponentiated, can be interpreted as hazard ratios (Allison 1982). In the models, exposure to the risk of teen marriage starts at age 12 for all women and ends on the date of teen marriage. Women who had not married in their teens are censored just before their 20th birthday.

I adopt a difference-in-difference (DID) logic that exploits variation in conflict-exposure across cohorts and space (i.e., where respondents lived at the time of the war). In its simplest form, the DID design envisages two populations and two time points. In the first period, both populations are

exposed to the same conditions. In the second, a "treatment" unrolls in one population ("treated"), but not in the other ("control/comparison"). Following this standard language, conflict is here to be thought of as the "treatment" condition. The design of this paper slightly differs from the traditional DID in its time component: rather than using a pre/post-"treatment" time-period variable, I rely on cohort variation, i.e., I compare conflict-exposed women who turned 12–19 during the conflict years with their not-affected peers and women aged 21+ at conflict start (thus no longer 'eligible' for teen marriage). This is because the main goal is to focus on teen ages, and conflict peaked in specific years; once these are fixed, the only variation comes from women's year of birth. This strategy also allows to fully harness the survey retrospective nature in lack of pre-/post-conflict rounds.

Equation 1 presents the basic statistical framework for empirical analysis:

$$\begin{aligned} \log(-\log(1-\pi_{ikdt})) = \alpha_t &+ \gamma\, Conflict_i \\ &+ \beta\,(Conflict_i \times War\text{-}Cohort_{ik}) \\ &+ \theta_k + \lambda_d + \upsilon_i + \varepsilon_{ikd} \end{aligned} \tag{1}$$

where π_{ikdt} is the conditional probability of teen marriage at interval *t* for woman *i* in cohort *k* in district *d* at wartime, provided that she has not already married. $War\text{-}Cohort_{ik}$ indicates women turning 12-19 during the conflict. In the main specification, $Conflict_i$ is the binary *overall conflict-exposure* indicator. The coefficient β of the interaction term identifies the relationship between being affected by conflict and the probability of entering teen marriage in the *War-cohort*. In alternative specifications, I relax the binary indicator into the continuous frequency (events) and intensity (fatalities) conflict indicators.

α_t is the duration function indicating how risk depends on time (effect of age on the hazard) and is specified by breaking the hazard function into *n* categories (<5 years, 5-6 years and >6 years) during which the risk of the outcome is assumed constant for women with the same pattern of covariates. θ_k and λ_d are birth-year and district dummies, respectively. These control for the underlying trend in teen unions due to belonging to an older versus a younger cohort, and for time-invariant local conditions affecting marriage patterns independent of conflict. Models also adjust for residence type.

Given endogeneity (women marrying earlier tend to leave school prematurely), the main models do not control for education. Finally, I add a 'frailty' term υ_i at the individual-level, which allows for unobserved heterogeneity. This term is interpreted as the residual between-women variance due to unmeasured time-invariant attributes that might influence one's 'susceptibility' to marriage, but that cannot be accounted for, e.g., women's parental education/wealth at wartime or union characteristics like arranged/forced marriages (South 2001; Uecker and Stokes 2008; Wiik 2009). This is analogical to individual fixed effects in standard panel data models. Moreover, 'frailty' prevents a biased estimation of the coefficients due to the "premature" exit from subjects whose omitted characteristics make them at "high-risk" of the outcome (Jenkins 1995). Regressions are estimated using sampling weights and standard errors are clustered at the primary sampling unit level.

In the main models, I exclude cohorts aged 19-20 in 1992 (born 1973-1972) as their "conflict-exposure" status is less clear-cut: some of them might have married during the conflict, but they were not exposed to violence during most of their adolescence. The USSR breakup possibly "contaminated" their marriage prospects more than the conflict itself. I address this issue in the checks. I also exclude respondents married before age 12 (<1%) and those aged 19 and below in 2006 because of right censoring on the outcome variable. Following these restrictions, the weighted sample comprises women aged 22-49 in 2006 (N=6,011), i.e., born between 1957-1971 and 1974-1984. Table A3.3 shows sample descriptive statistics.

Any causal interpretation and the accuracy of the estimates rely on the assumptions that trends in teen unions would have been the same across the *War* and *Soviet* cohorts in the absence of conflict, and that there were no omitted time-varying effects associated with the conflict indicators. I test the plausibility of these assumptions, including balance of covariates and placebo tests, as much as data allow in Appendix B. Lastly, it is worth re-emphasising that conflict-due migration was largely involuntary and universal (all ethnic Azerbaijani in Nagorno-Karabakh/Armenia were expelled from their home territories), displacement was the main form of internal migration during the years of turmoil (international emigration concerned mainly ethnic Russians and Armenians (Aliyev 2006; Allahveranov et al. 2012; Rowland 2004) and IDP/refugee status was granted *prima facie* by the

Azerbaijan government to persons fleeing their homes due to the war. Return was not possible, and expellees were culturally and ethnically akin to non-movers and residents in non-conflict areas.[9] Unfortunately, no data source allows examining mortality during the flight and related selection in survival. However, the above features should free the operationalisation of the conflict indicators and the estimates from other serious selectivity issues. 'Frailty' terms correct for the selective impact of unobserved factors, and I dedicate special attention to heterogeneity by displacement status

3.6 Results

3.6.1 Descriptive analyses of entry into teen marriage

Table 3.1 presents measures of central tendency and the cumulative probability of being married by ages 15 to 19 for women born 1957-1984. This includes women who reached their teens during more stable Soviet years (born 1957-1968), who did so partially during the first years of socio-economic instability (1969-1973) and women attaining adolescent ages almost entirely during the conflict and post-Soviet early transition period (1974-1984).

Some interesting patterns arise: first, the mean and median ages at marriage are higher for the 1957-1971 cohorts reaching teen ages in a more stable macro-economic and social environment. The decrease in measures of central tendency characterising younger cohorts seems attributable to a rising proportion of girls marrying in teen ages. For instance, the share of girls born in 1974-1977 married by age 16 and 17 is, respectively, almost 8% and 12% points higher compared to the 1969-1971 cohorts. The same proportions are about 7% and 9% larger than for women born just before (1972-1973). Very similar increases characterise the 1978-1980 cohort. This latter group shows the highest proportion of married by age 15 (3.33%) and 16 (10.18%). Thus, there appears a pattern of earlier entry into union for the cohorts reaching teen ages in the precarious conflict and independence period. Second, among these women, the proportion of unmarried by age 20 steadily increased. For instance, while 61% of the 1974-1977 cohort were still single at age 20, the share was about 4% and 11%

[9] Among observable characteristics in the analytic sample, the only significant differences were in urban/rural residence and household wealth, with non-migrant conflict-exposed women being more likely to reside in rural areas and poorer. This is expected given that IDPs/refugees clustered in urban areas and often relied on dedicated state financial support.

points higher in the 1978-1980 and 1981-1984 cohorts, respectively. Seemingly, the "rush" to marry was more prevalent in older *War-cohorts* and only occurred at the youngest teen ages (15-17) for those born after 1977.

The Kaplan-Meier curves in Figure 3.2 describe these patterns more succinctly and with a greater focus on conflict-exposure. Differences between the *Soviet* and *War-cohorts* are irrelevant until age 15 (Panel A). By age 16, though, the curves start diverging, with a slower entrance at all following ages for the *Soviet cohort*. The largest gap is between ages 17-18 (8 vs. 17%).

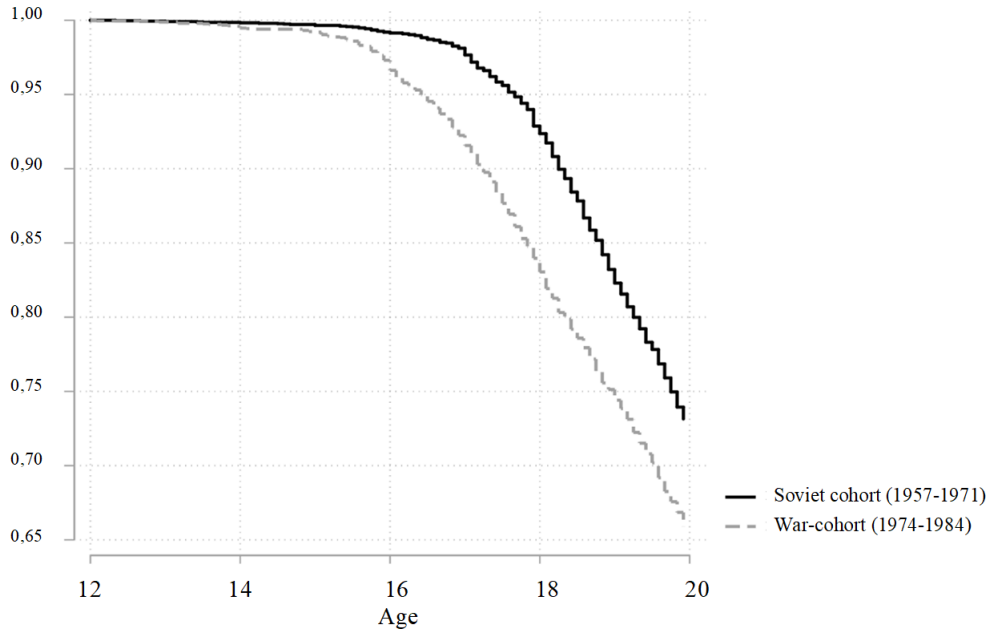
Table 3.1 Cumulative probabilities of teen marriage by birth cohort (1957–1984)

3-year birth cohort	Mean marriage age	Median marriage age	Age first married (%)						*N* (weighted)
			15 and below	16 and below	17 and below	18 and below	19 and below	Not married by 20	
1957-1959	21.78	21	1.29%	3.71%	10.42%	21.89%	31.14%	68.86%	525
1960-1962	22.51	22	0.56%	1.81%	6.58%	16.53%	24.40%	75.60%	767
1963-1965	22.04	22	1.40%	1.73%	7.51%	16.77%	27.55%	72.45%	779
1966-1968	21.43	21	0.98%	2.88%	9.35%	20.46%	31.17%	68.83%	702
1969-1971	21.91	21	0.39%	1.11%	6.41%	14.71%	29.82%	70.18%	696
1972-1973	21.22	20	0.67%	1.87%	9.82%	22.41%	39.56%	60.44%	403
1974-1977	**20.79**	**20**	**3.18%**	**8.91%**	**18.36%**	**28.50%**	**38.90%**	**61.10%**	**804**
1978-1980	**20.16**	**20**	**3.33%**	**10.18%**	**16.99%**	**25.62%**	**35.33%**	**64.67%**	**665**
1981-1984	**19.68**	**20**	**2.14%**	**5.82%**	**12.84%**	**19.80%**	**27.67%**	**72.33%**	**1,073**
Total obs.									6,414

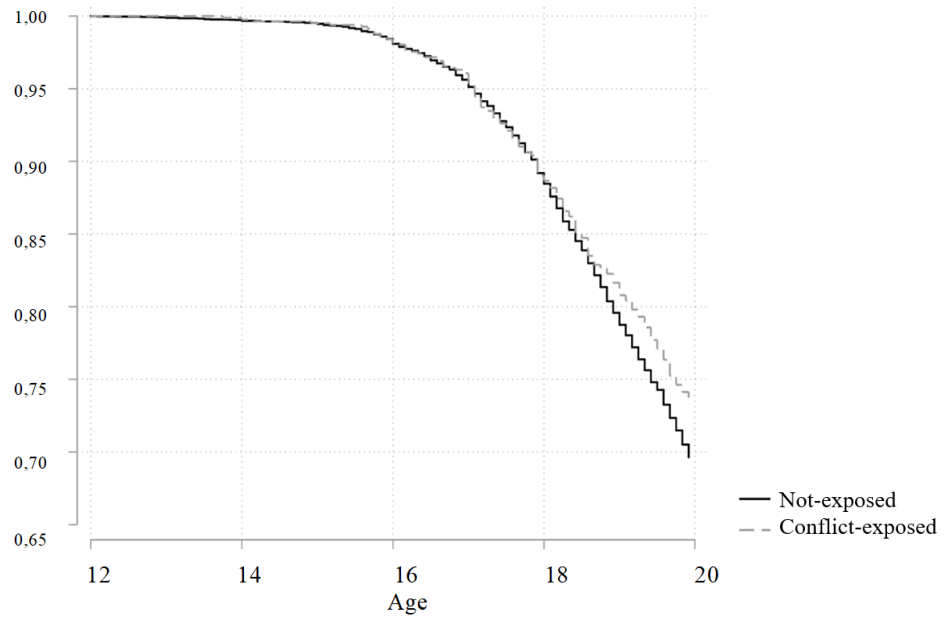
Source: 2006 AZ-DHS. Notes: Cohorts of women who reached teen ages during the conflict years are highlighted in bold.

Figure 3.2 Kaplan-Meier curves for teen marriage by cohorts (Panel A) and conflict-exposure (Panel B)

PANEL A



PANEL B



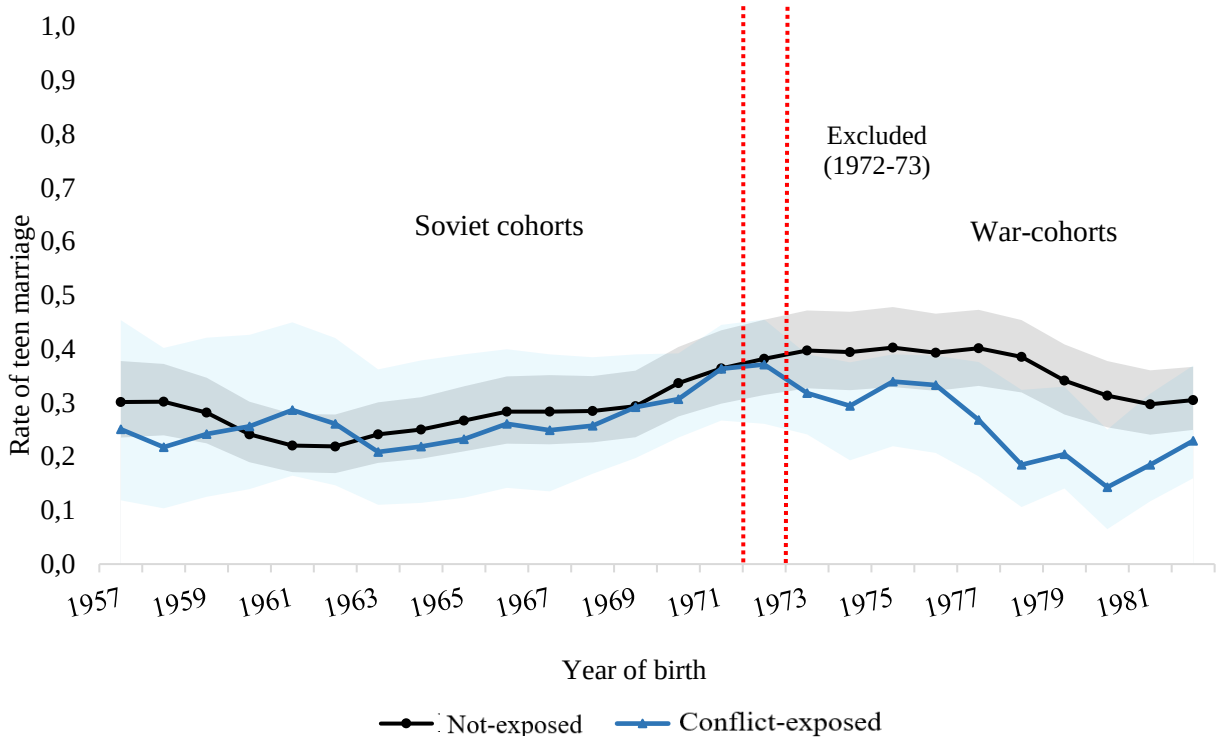
Source: 2006 AZ-DHS. Author's calculation.

The faster entry into marriage of the *War-cohort*, however, is only one part of the story. Not all women born in the 1974-1984 decade were affected by violence in Nagorno-Karabakh. Kaplan-Meier estimates for teen marriage by conflict-exposure show very little difference between the groups (Figure 3.2, Panel B). Only after age 18 do the curves marginally separate: conflict-exposed women marry slightly later than the not-exposed.

As the above descriptions do not supply a univocal picture of the conflict/cohort relationship, I graphically investigate trends in teen marriage rates by birth cohort and overall conflict-exposure. On the left-hand side of Figure 3.3, there are the rates by conflict-exposure for the *Soviet cohorts*, namely women who were too old at conflict onset to have their chances of marrying in adolescence affected by violence. On the right-hand side, rates for women in the *War-cohorts* who were either exposed or not to the conflict. Trends for women in the *Soviet cohorts* with differential exposure to the conflict are similar and generally move in parallel. Conversely, there is a wider divergence in the *War-cohorts*: the not-exposed have higher and broadly stable teen marriage rates, whereas those of their conflict-exposed peers follow a marked, albeit fluctuating, declining pattern. This visual inspection thus suggests a peculiarly different behaviour for women enduring conflict during adolescence compared to both non-affected peers and older women. It also alleviates concerns linked to diverse pre-war marriage trends between groups differently affected by the conflict, thereby reinforcing the logic of the modelling strategy, whose results I discuss next.[10]

[10] Additional supporting information on the empirical strategy and assumption checks are in Appendix B (Tables B3.1–B3-3). Before survival models, I performed a set of linear probability models that included an interaction between *War-cohort* and each conflict indicator on a set of dependent variables indicating the probability of marriage by each age from 15-19 on both the full sample and on samples of those at risk of each outcome by 1996. Results (not presented for space reasons) showed no significant differences, except at age 19, for conflict-exposed women born 1974-1984, although the relationship was negative at most cut-offs.

Figure 3.3 Trends in teen marriage by conflict status and cohorts



Source: 2006 AZ-DHS. Author's calculation. Shaded areas indicate 95% confidence intervals.

3.6.2 Survival models

Table 3.2 shows estimates of survival models specified with a DID *logic* in exponentiated form (hazard ratio, HR). Coefficients greater/lower than one denote a higher/lower risk of teen union compared to the reference category and represent the instantaneous hazard of teen marriage. The first two columns report the results of the baseline specification without controls, except for duration dependence (Col. 1), and adjusted estimates (Col. 2) for the main independent variable.

Both models reveal a significantly negative coefficient estimated on the interaction between *War-cohort* and *overall conflict-exposure*: the risk of teen union is about 34% points lower (Col. 1: HR 0.659, 95% C.I. 0.447-0.972) for exposed women born in 1974-1984 compared to their non-affected peers and older women (with the same unobserved characteristics). The sign and magnitude are similar when controls are included (Col. 2). The minor amount of variance due to unobserved woman-level characteristics suggests that reductions for the women exposed to the conflict do not simply result from selection due to unobserved factors.

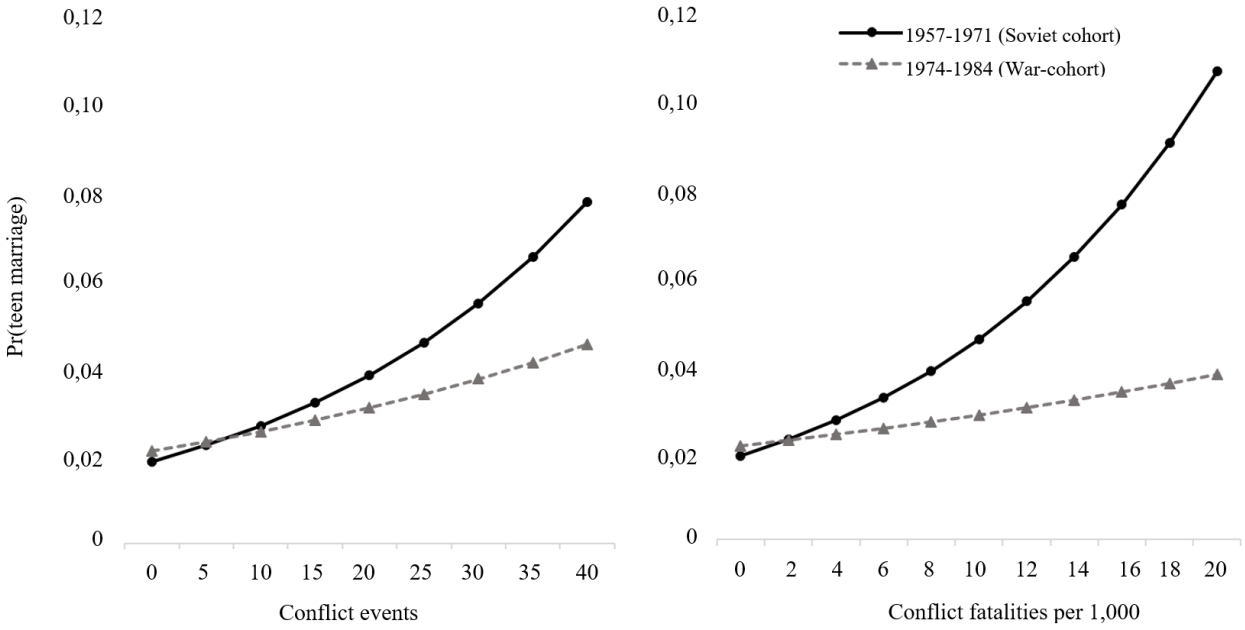
When I use the continuous conflict frequency and intensity measures, the results confirm a significant negative association (Cols. 3-4). For instance, one standard deviation increase in district fatalities (2.5 casualties) lowers teen marriage risk by about 14% in the *War-cohort*. The continuous measures have similar coefficient sizes and trajectories due to their strong correlation and can be visualised in Figure 3.4. While the predicted probability of entering union in teen ages is approximately the same for women in the *War-cohort* and *Soviet cohorts* who did not experience any violence, it increases much less rapidly for the former as the number of conflict events and fatalities increases. The coefficient of *conflict frequency* is positive and significant, denoting that intense violence occurred in areas with higher levels of teen marriage.

Table 3.2 Discrete-time clog-log models of the transition to teen marriage

	HR of teen union			
	(1)	(2)	(3)	(4)
War-cohort (1974-1984) * Conflict measure	0.659*	0.635*	0.983*	0.942*
	[0.45,0.97]	[0.43,0.94]	[0.97,0.99]	[0.88,0.98]
Overall conflict-exposure (ref: Not-exposed)				
Conflict-exposed	1.001	1.268		
	[0.72,1.39]	[0.74,2.17]		
Conflict events			1.037*	
			[1.00,1.07]	
Conflict fatalities per 1,000				1.093
				[0.96,1.24]
District FE	No	Yes	Yes	Yes
Year of birth FE	No	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes
σ_u^2	1.559	1.127	1.141	1.121
N person-years	44,885	44,885	44,885	44,885

Source: 2006 AZ-DHS. Notes: Sample consists of women born 1957–1984 (ages 22–49 in 2006), excluding women born 1972-1973. Subjects enter analysis at age 12. Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at the PSU level. The "War-cohort" includes women born 1974-1984. The binary indicator "overall conflict-exposure" includes IDP/refugee women, non-migrant women residing in Upper-Karabakh and non-displaced women with at least one male member of their family of origin (or mother) who identified as IDP/refugee. All regressions control for duration since start of exposure to the risk of teen marriage (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Models are specified with individual-level frailty terms (σ_u^2) and are weighted using provided sampling weights. * p<0.05, ** p<0.01, *** p<0.001.

Figure 3.4 Predicted probabilities of teen marriage by conflict exposure frequency and intensity



Source: As per Table 3.2, Columns 3 and 4.

3.6.3 Alternative measures and robustness checks

Results are robust to various checks. First, I restricted the *Soviet cohort* to include only women aged 21-31 in 1992 (born 1961-1971). To the detriment of sample size, this makes this group as close, and therefore, as comparable as possible to the *War-cohort*. Estimates do not change substantively (Table B3.4). The coefficient size is now larger for all conflict indicators, strengthening the finding of a negative association.

Second, I run Eq.(1) including the 1972-1973 cohorts in the sample. Women born in 1972 were aged 20 at conflict onset, while the 1973 cohort was 19. Initially, I code both as belonging to the *Soviet cohort*. Next, I split them so that the former is assigned to the *Soviet cohort* and the latter to the *War-cohort*. The direction and size of the relationship remain unchanged in both specifications (Tables B3.5-B3.6). In the first model, though, the reduction is stronger ($p<0.01$) for the binary and frequency indicators, suggesting that the largest differences emerged for women aged 18 or below at the start of the full-blown war.

Third, I recoded the continuous conflict measures into three categories for "No events/fatalities", "Medium" (between one and the 95th percentile, i.e., 24 events and 5.6 fatalities) and "High" (above the 95th percentile). Estimates show that the reduction was essentially driven by medium frequency of exposure and high-intensity violence (Table B3.7).

Fourth, I estimated models excluding non-displaced women residing in the Ganja-Qazakh region, where a few conflict events also took place. Results are unchanged with respect to the main models, except for the conflict frequency measure. Here, the relationship is still negative but is no longer significant (p=0.08). Estimates did not change when I coded as not-affected non-IDP/refugee women with an IDP/refugee member of their origin families, when I excluded them or dropped refugees from Armenia from the sample (not shown).

Models estimated with a logit-link function, alternative specifications of duration dependence (e.g., quadratic, cubic), cut-offs for early unions (e.g., survival time to marriage from 12 to 16/18 to focus on the earliest ages at marriage), shorter conflict time-window (1992-1994/95), including an education dummy (completed mandatory 9-years of schooling) and exposure to media sources did not yield different results.

Due to data availability, the approach taken here is not that of a traditional DID. Hence, performing its entire battery of sensitivity tests was not feasible. However, the robustness of the findings to different specifications, thresholds and definitions, and the checks presented in Tables B3.1–B3.3 are reassuring as for the validity of the main results.

3.7 Heterogeneity

3.7.1 Does age at conflict matter?

Determined the presence and sign of the relationship, the next relevant question concerns whether all conflict-exposed women in the *War-cohort* experienced systematic declines, or if these were limited to specific cohorts and hence ages at conflict. Reasonably, we could expect the strongest relationship for girls who spent most of their time 'at risk' of teen union under conflict conditions, i.e., those aged

12-14 at conflict onset (16-18 at denouement). I, therefore, re-estimated the models using a finer cohort measure which spells out the relationship for women born in 1974-1977 (aged 15+ in 1992), 1978-1980 (14-12) and 1981-1984 (11-8). Results in Table 3.3 show a lower risk of teen union for all *War-cohort* sub-groups. Though, the reduction is significant only for the hypothesised 1978-1980 cohort (HR: 0.327; 95% C.I. 0.156-0.689). No differences in risk characterise women who experienced conflict predominantly in their late teens or childhood.[11] To aid interpretation, Figure 3.5 shows predicted probabilities for each combination of the interaction term from Col. 1.

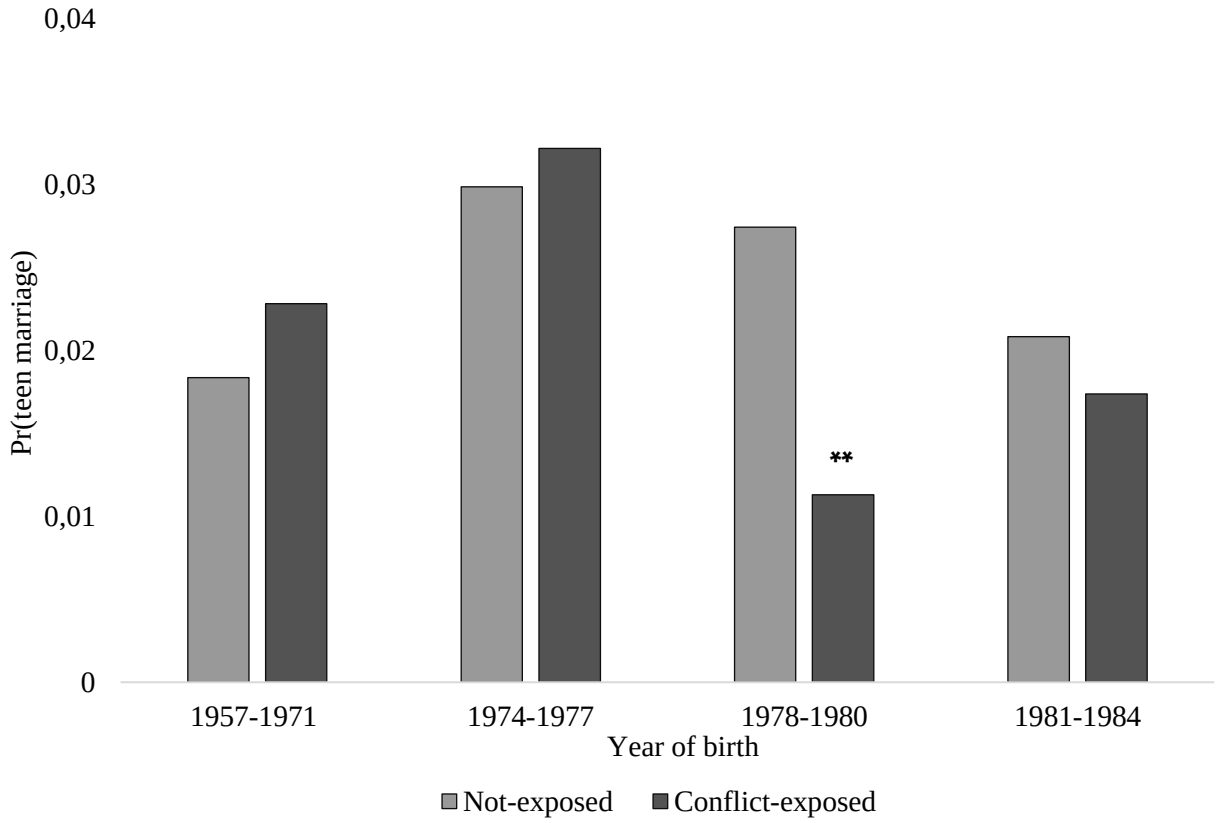
Table 3.3 Discrete-time clog-log models of the transition to teen marriage by granular cohorts

	HR of teen union		
	(1)	(2)	(3)
Conflict measure * Born in			
1974-1977	0.866	0.992	0.969
	[0.50,1.49]	[0.97,1.00]	[0.92,1.02]
1978-1980	0.327**	0.958*	0.846*
	[0.16,0.69]	[0.92,0.97]	[0.74,0.96]
1981-1984	0.668	0.986	0.958
	[0.37,1.20]	[0.96,1.01]	[0.87,1.06]
Overall conflict-exposure (ref: Not-exposed)			
Conflict-exposed	1.246		
	[0.73,2.12]		
Conflict frequency (events)		1.037*	
		[1.00,1.07]	
Conflict intensity (fatalities per 1,000)			1.107
			[0.94,1.30]
District FE	Yes	Yes	Yes
Year of birth FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
σ_u^2	1.181	1.152	1.134
N person-years	44,885	44,885	44,885

Source: 2006 AZ-DHS. Notes: Sample consists of women born 1957–1984 (ages 22–49 in 2006), excluding women born 1972-1973. Subjects enter analysis at age 12. Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at the PSU level. The "War-cohort" includes women born 1974-1984. The binary indicator "overall conflict-exposure" includes IDP/refugee women, non-migrant women residing in Upper-Karabakh and non-displaced women with at least one male member of their family of origin (or mother) who identified as IDP/refugee. All regressions control for duration since start of exposure to the risk of teen marriage (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Models are specified with individual-level frailty terms (σ_u^2) and are weighted using provided sampling weights. * p<0.05, ** p<0.01, *** p<0.001.

[11] Findings were robust to other cohort groupings, e.g., single-, two- and four-years. Statistically significant negative associations effectively characterised conflict-exposed women born in 1975, 1978-1980 and 1982.

Figure 3.5 Predicted probabilities of teen marriage by conflict exposure and granular cohorts



Source: As per Table 3.3, Column 1. * p<0.05, ** p<0.01, *** p<0.001.

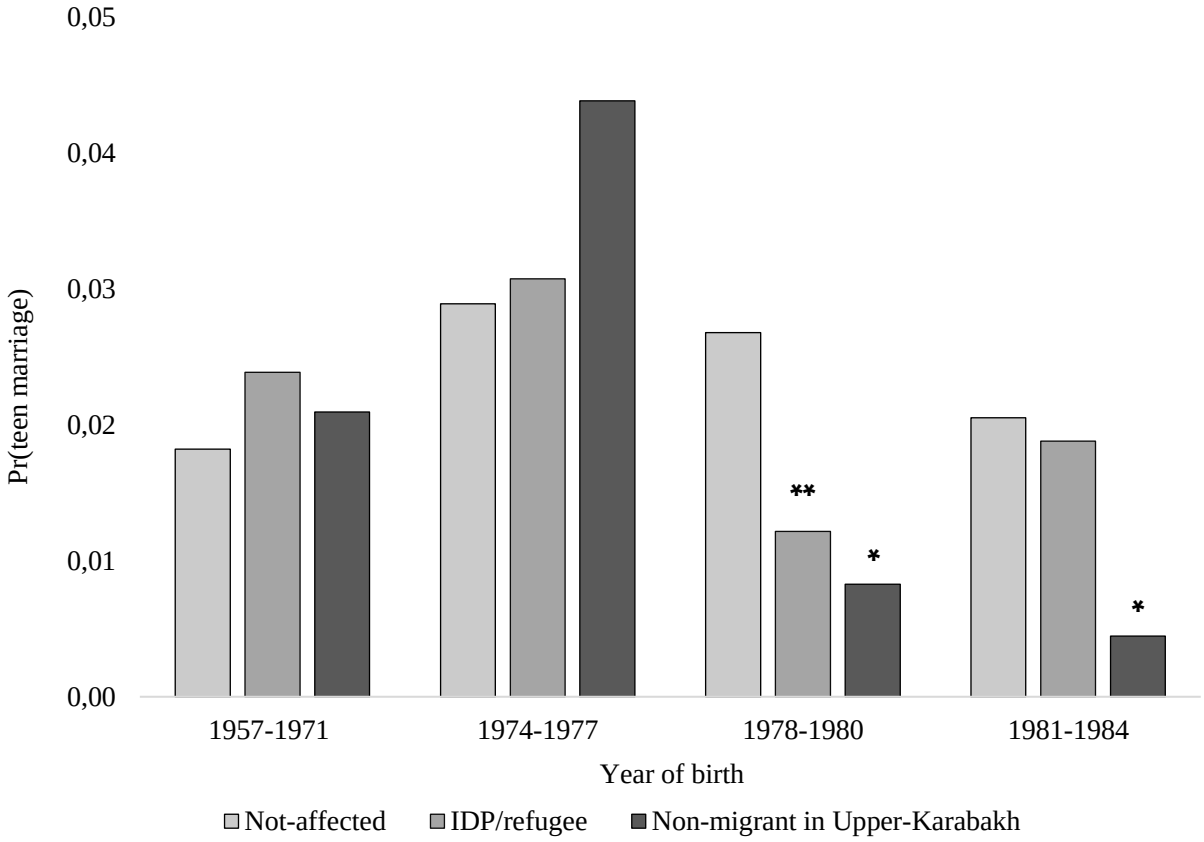
The different early marriage behaviour of exposed and not-exposed girls born 1978-1980 suggests that in Azerbaijan, entry into teen unions was neither immediately manipulated by families as a response to conflict threats, nor the impact extended to cohorts attaining adolescent ages towards the later stage of the war. Rather, the negative association characterised only those in their early teens at conflict onset, and thus who were for the longest 'eligible' for teen marriage under conflict conditions.

3.7.2 The role of forced migration

Several underlying forces may explain the lower levels of early marriage for the 1978-1980 cohorts. One is forced migration. For these girls, displacement occurred precisely in ages when they (and their families) would be more likely to take a decision about teen marriage and search for suitable spouses. Conceivably, their displacement and resultant disruption in livelihoods/social networks hindered union formation. In contrast, younger displaced girls had seemingly more time and relatively more

stable conditions (e.g., in tent settlements with better access to social and economic assistance) to meet future grooms before actually becoming 'at risk' of teen marriage. Slightly older women in the *War-cohort* could have had their marriages already arranged before the conflict and, perhaps, sought to relocate to areas near to or with their prospective husbands. I test these hypotheses by adding an interaction between each 3-year *War-cohort* and women's conflict-related migration status, spelling out the categories of the *Overall conflict-exposure* indicator. Figure 3.6 presents predicted probabilities of teen marriage from the model (Table A3.4 for full estimates).

Figure 3.6 Predicted probabilities of teen marriage by conflict-related migration status and granular cohorts



Source: As per Table A3.4 (Appendix A), Column 1. * p<0.05, ** p<0.01, *** p<0.001.

The probability of teen marriage is quite low and similar across groups in the *Soviet cohorts*. Non-significant increases characterise all women aged 18-15 at conflict onset (1974-1977 cohorts), particularly non-migrants of Upper-Karabakh. Teen marriage probability drops sharply for forcibly displaced women born in 1978-1980, whereas no significant changes mark their non-affected counterparts. As hypothesised, the decline in the displaced group is limited to this cohort and does not "spread" to the following one.[12] For non-migrants in Upper-Karabakh, there are significant reductions in teen marriage for the 1978-1980 cohorts that further extend to girls who began to be 'at risk' of the outcome towards the end of the conflict. Their chances of becoming teen brides are close to zero. Although this finding may be due to small cell numbers, other mechanisms may explain the peculiar behaviour of this group, including a short supply of male partners. Unfortunately, similar sex-ratio factors cannot be tested with available data.[13,14]

3.8 Limitations

While the finding of a reduction in unions is clear and robust to various measurements and checks, examining teen marriage outcomes disaggregated by conflict sub-groups and cohorts exposes the research to the estimation risks inherent to small samples. Moreover, the cross-sectional character of most AZ-DHS variables, and limited access to other data sources, prevented me from examining many theoretically plausible mechanisms. This is regrettable, especially for sex-ratio factors and other

[12] When I further disaggregated the variable to differentiate between refugees and IDPs, the results did not change substantively. Refugees from Armenia born in 1978-1980 appeared to be the most sensitive to the declining risk of teen union, but caution against interpreting the estimates is warranted given the small sample.

[13] Due to the high politicisation of the conflict, data are insufficient to test whether a conflict-caused decline in sex-ratio in districts of Upper-Karabakh was related to the lower marriage probability of these, and other conflict-exposed women. Pre-conflict (USSR) district-level census data are not available disaggregated by age, sex (and ethnicity) nor are post-independence population data. Even if it were possible to build post-conflict measures with the AZ-DHS or 1995 Living Standard Survey, these would be not useful in the absence of pre-war information on district-level age and sex structure.

[14] I examined male marriage outcomes using a subsample of respondents selected for the AZ-DHS men's questionnaire (N=1,941). I observed neither differences in marital timing between men born in the *Soviet* and *War*-cohorts (even if interacted with region indicators to examine differences across areas with a larger influx of IDPs/refugees) nor between those exposed/not-exposed to the conflict. This perhaps suggests a marriage-market preference for not-exposed women.

known determinants of early unions such as parental/household characteristics (Kohno et al. 2020; Pesando and Abufhele 2019). The selective impact of the latter is accounted for by 'frailty' terms included in the models.

Although the study sought to thoroughly exploit the depth and breadth of available data, the lack of GIS cluster information and migration histories for all women may have created measurement errors in the conflict indicator. The use of multiple conflict measures and the fact that intense violence occurred in Nagorno- and Upper-Karabakh should limit this concern. Continuous conflict indicators should though be understood as supplementary and providing auxiliary indications on intensive margins. It is also worth noting that I cannot fully exclude social desirability bias and misreporting of displacement status. However, concerns over status over/under-reporting (EGRIS 2018) are reduced by (i) my coding procedure (including as conflict-exposed women with a displaced person in her natal household), (ii) the survey aims (not linked in any way to direct refugee/IDP assistance), (iii) the question used to identify forced migrants and (iv) the generally neutral attitudes towards displaced persons found in the Azerbaijani context (UNHCR 2009).

Moreover, I found no evidence of marriage age heaping and/or age displacement across conflict-related variables that could be of concern (Chantler 2012). Issues related to the dependent variable are also attenuated by the survey question used to capture union formation. Finally, estimates are based on a sample of survivors residing in Azerbaijan in 2006 and there is no direct way to determine if teen marriages were underestimated because of survival bias.

Overall, the results should be interpreted carefully as a first attempt at providing answers to questions on *whether* and *how* violence is associated with early unions. Future research should strive for causal assessment and expand this line of inquiry into the "*whys"*. To confirm causality and investigate specific driving pathways, though, further efforts in developing new tools or refining existing ones, e.g., oversampling conflict-torn populations and including conflict-sensitive questions in surveys, are inevitably required (Brück et al. 2016).

3.9 Discussion and conclusion

Does exposure to armed conflict influence teen marriage? Existing knowledge on this paramount question either comes from qualitative research unsuited to evaluate population-level relationships or is extrapolated from quantitative studies focusing on changes in general marriage outcomes, not early unions (Neal et al. 2016). These latter analyses examine a few contexts, with a narrow set of methodological approaches that often hide differences across ages and conflict experiences. The resultant evidence is largely inconclusive, and therefore of limited assistance to policy.

This study tackles this knowledge gap and provides a first empirical test of the link between war and early marriage. Findings reveal that in Azerbaijan, experiencing war in adolescence was associated with reductions in teen unions, principally for girls who spent most of their teens under active violence and, among them, forced migrants. Conflict intensity and frequency were also linked to lower risk of early marriage.

These results echo findings from prior studies that investigated the broader conflict/marriage nexus in settings with similar conflict typology (Khawaja and Randall 2006) and institutional framework to Azerbaijan (Shemyakina 2013). As for coefficient size, the magnitude is comparable to changes in marriage law raising the minimum marriage age in the Americas (Bellés-Obrero and Lombardi 2019; Bharadwaj 2015), but seemingly larger than weather shocks (Corno et al. 2020). Additionally, results are likely a lower-bound of the true effect since the conflict erupted in full in 1992, but tensions emerged in the late 1980s.

A decline in teen marriage for conflict-affected girls is a welcome and, perhaps, unexpected result considering suggestions from qualitative accounts. However, some caution in interpreting and generalising this finding is warranted as the slowdown in teen marriage coincided with an antithetic general increase in the Azerbaijani population compared to the Soviet period. The results, therefore, subsume two kinds of differences: one *between* the Soviet and War-cohorts; the other *within* the War-cohorts. The first likely captures the diverse socio-economic incentives and family regimes the *Soviet* and the *War-cohorts* experienced when teens. The former lived under a system where financial

stability, security, family-related services, and regulations were arguably provided by the State; conversely, the *War-cohorts* reached adolescence as such value, economic and legal systems collapsed. For the non-affected among them, early marriages reasonably represented a source of stability against these swift socio-economic setbacks, a response observed in other ex-Soviet Central Asian countries (Agadjanian and Makarova 2003; Clifford et al. 2010; Dommaraju and Agadjanian 2008). The second difference then captures the extra variation *within* the War-cohorts due to the additional insecurity generated by conflict. Ergo, the final result is to be understood as a combination of experiencing the conflict *as well as* the transition to a new socio-political regime.

These findings provide new evidence on family formation decision-making in times of violence, and in relation to different stressors and sources of insecurity. Formally testing explanatory mechanisms was not possible due to data constraints. I nonetheless sought to disentangle associations by cohort and advance some speculations on driving channels. Since reductions occurred essentially in a single conflict-affected cohort group, women's life-stage at war onset and length of time spent 'at risk' of teen marriage under conflict conditions seem to matter more than the experience of violence itself. This result further highlights the importance of applying cohort/life-course lenses when studying the consequences of macro-level events.

Since the delay was particularly pronounced for displaced girls, there is reason to think that forced migration in specific life-stages constituted a pathway for marriage postponement. In the earliest phases of displacement, forced migrants incurred significant unplanned and emergency expenditures, e.g., relocation travels, that, along with low income-generating opportunities and deteriorated housing conditions, strained their economic welfare (Gureyeva-Aliyeva and Huseynov 2011; IDMC 2007; SORGU and World Bank 1995). As a result, these families perhaps could not afford the expected wealth transfers occasioned by weddings, including finding suitable housing for prospective couples (Saxena et al. 2004), and opted for or were forced to divert their limited resources on investments other than marriages that were not required to non-affected households (Sieverding et al. 2020).

Moreover, forced migration from Nagorno-Karabakh and Armenia separated extended households

and disrupted community ties (Amnesty International 2007; UN Commission on Human Rights 1999). At least in the initial post-displacement years, this sudden social fragmentation and loss of intangible assets perhaps frustrated the search for potential spouses of displaced families and girls then "suitable" for marriages. As conditions stabilised, new networks of support and norms of reciprocity between neighbours who were strangers before displacement possibly favoured again partner selection and the arrangement of weddings. This could partially explain the lack of relationship for IDPs/refugees born after 1980.

The sharp declines in unions for the youngest non-migrant cohorts suggest comparable, but longer disruptive changes in the social fabric due to conflict. A tentative explanation, that cannot be addressed with present data, relates to imbalances in sex-ratio. Conceivably, conflict-caused high male mortality and conscription imposed structural changes to the local marriage market of Upper-Karabakh, lowering the amount of available prospective husbands (De Walque 2006). Although Shemyakina (2013) did not find any relationship between declines in marriage and sex-ratio in Tajikistan, a country that experienced conflict around the same time and with socio-cultural backgrounds comparable to Azerbaijan, similar mechanisms should not be discarded and represent an important avenue for future research.

Delaying marriages from teen to adult ages, even by a few years, is a desirable outcome for Azerbaijan and girls in violent contexts. This finding though does not exclude adverse marriage outcomes from happening just a bit later than in adolescence. In humanitarian emergencies, young men's inability to afford bride-price, their conscription, and excess mortality could reduce match quality, leading women to marry older or less educated men (Grabska 2012; Sommers et al. 2011). Wide spousal age and educational differences are known predictors of marital dissolution (Burazeri et al. 2005) or domestic violence (La Mattina 2017; Mabsout and Van Staveren 2010). The share of conflict-affected born in 1974-1984 eventually marrying a man aged 10+ years older in the AZ-DHS is more than double that of older women (16 vs. 6%). Likewise, this group was significantly more likely to marry men with lower educational attainment (p=0.003). Together with changing marriage timing, conflict possibly constrained women's choices via a deteriorated pool of potential husbands.

Policy intervention should consider all these aspects. As conflict-induced declines in early unions imply that young women will depend for longer on their families and/or own resources, it is critical to ensure access to learning opportunities that can make girls prospectively less reliant on future partners, or less acquiescent to unwanted marriage arrangements, which may present slightly later in their life-course. Widening learning opportunities would have broader positive spillover and intergenerational effects. Above and beyond conflict, though, we need concerted policy and research efforts to tackle the rooted socio-cultural acceptance of unwanted early marriage and to effectively implement legal frameworks for child and adolescent protection where, as in Azerbaijan, its prevalence is high.

3.10 Appendix A

Table A3.1 Definitions of conflict measures

Group	*N*/% (weighted)	Binary indicator	Continuous frequency indicator	Continuous intensity indicator
Panel A: Cohorts				
Born 1974-1984 (aged 12-19 between 1992-1996)	2,542 42.28%	1 "War-cohort"		
Born 1957-1971 (aged 21+ in 1992)	3,469 57.72%	0 "Soviet cohort"		
Panel B: Conflict-exposure				
IDPs from Nagorno-Karabakh; Non-refugees/IDPs with one displaced male member (or the mother, if household head) in origin family	301 5.00%	1 "Conflict-exposed"	Number of conflict events in 1992-1996 in district of origin	Number of conflict fatalities in 1992-1996 in district of origin per 1,000 population (as of the 1989 USSR Population Census figures, *omitted thereafter*)
Refugees from Armenia	168 2.79%	1 "Conflict-exposed"	Mean number of conflict events in 1992-1996 in all Nagorno-Karabakh districts	Mean number of conflict fatalities in 1992-1996 in all Nagorno-Karabakh districts per 1,000 population
Permanent residents in contested districts (including non IDP/refugees migrating there during conflict)	175 2.91%	1 "Conflict-exposed"	Mean number of conflict events in 1992 (or year of arrival for migrants)-1996 in contested districts (Agdam, Terter and Fizuli)	Mean number of conflict fatalities in 1992 (or year of arrival for migrants)-1996 in contested districts (Agdam, Terter and Fizuli) per 1,000 population
All other women	5,367 89.30%	0 "Not-exposed"	None	None

Notes: In Panel A, the table shows cohort grouping for women who attained their teen ages between 1992-1996. In Panel B, it first shows the different groups making up the binary "overall conflict-exposure" indicator, their counts and relative percentages in the analytic sample. It then shows how the continuous indicators were calculated for each group, in the absence of specific information on the district of residence for some groups (e.g., for refugees from Armenia) and considering their different locations during the conflict.

Table A3.2 Table of women's attained ages during conflict by birth cohort

	Age in 1992	Age in 1996	Age in 2006	Year woman attains age 12	Year woman attains age 19	Weighted *N*
1957	35	39	49	1969	1976	131
1958	34	38	48	1970	1977	195
1959	33	37	47	1971	1978	199
1960	32	36	46	1972	1979	236
1961	31	35	45	1973	1980	274
1962	30	34	44	1974	1981	257
1963	29	33	43	1975	1982	254
1964	28	32	42	1976	1983	265
1965	27	31	41	1977	1984	260
1966	26	30	40	1978	1985	250
1967	25	29	39	1979	1986	220
1968	24	28	38	1980	1987	233
1969	23	27	37	1981	1988	211
1970	22	26	36	1982	1989	250
1971	21	25	35	1983	1990	235
1972	20	24	34	1984	1991	197
1973	19	23	33	1985	1992	206
1974	**18**	22	32	**1986**	**1993**	**203**
1975	**17**	21	31	**1987**	**1994**	**185**
1976	**16**	20	30	**1988**	**1995**	**213**
1977	**15**	**19**	29	**1989**	**1996**	**203**
1978	**14**	**18**	28	**1990**	**1997**	**205**
1979	**13**	**17**	27	**1991**	**1998**	**196**
1980	**12**	**16**	26	**1992**	**1999**	**264**
1981	11	**15**	25	**1993**	**2000**	**220**
1982	10	**14**	24	**1994**	**2001**	**291**
1983	9	**13**	23	**1995**	**2002**	**305**
1984	8	**12**	22	**1996**	**2003**	**256**
Overall Total	8-35	12-39	22-49			6,414

Source: 2006 AZ-DHS. Notes: N indicates the total number of women in the sample (including women born 1972-1973) weighted using provided sample weights. In bold are birth cohorts of women who reached teen ages (12-19) between 1992-1996 and hence were 'at risk' of teen union during the peak years of the Nagorno-Karabakh conflict.

Table A3.3 Descriptive statistics of weighted sample used in the analyses

	N	Mean or %	*s.d.*	Min	Max	Person-years
Conflict frequency (events)	6,011	1.97	6.69	0	73	44,885
Conflict intensity (fatalities per 1,000)	6,011	0.56	2.48	0	66.38	44,885
Age	6,011	35.08	8.36	21	49	44,885
Overall conflict-exposure						
Not-exposed	5,367	89.30%				40,062
Conflict-exposed	644	10.70%				4,823
Cohort						
1957-1959	525	8.73%				3,921
1960-1962	767	12.76%				5,857
1963-1965	779	12.95%				5,901
1966-1968	702	11.69%				5,296
1969-1971	696	11.59%				5,309
1974-1977	804	13.37%				5,787
1978-1980	665	11.06%				4,827
1981-1984	1,073	17.85%				7,987
Conflict cohort						
1957-1971	3,469	57.72%				26,280
1974-1984	2,542	42.28%				18,605
Residence type						
Rural	2,599	43.75%				19,205
Urban	3,412	56.25%				25,680
Married in teen ages						
Yes	1,846	30.71%				11,572
No	4,165	69.29%				33,313
Married by 15						
Yes	104	1.69%				-
No	5,907	98.31%				-
Married by 16						
Yes	280	4.64%				-
No	5,731	95.36%				-
Married by 17						
Yes	675	11.19%				-
No	5,336	88.81%				-
Married by 18						
Yes	1,229	20.32%				-
No	4,782	79.68%				-

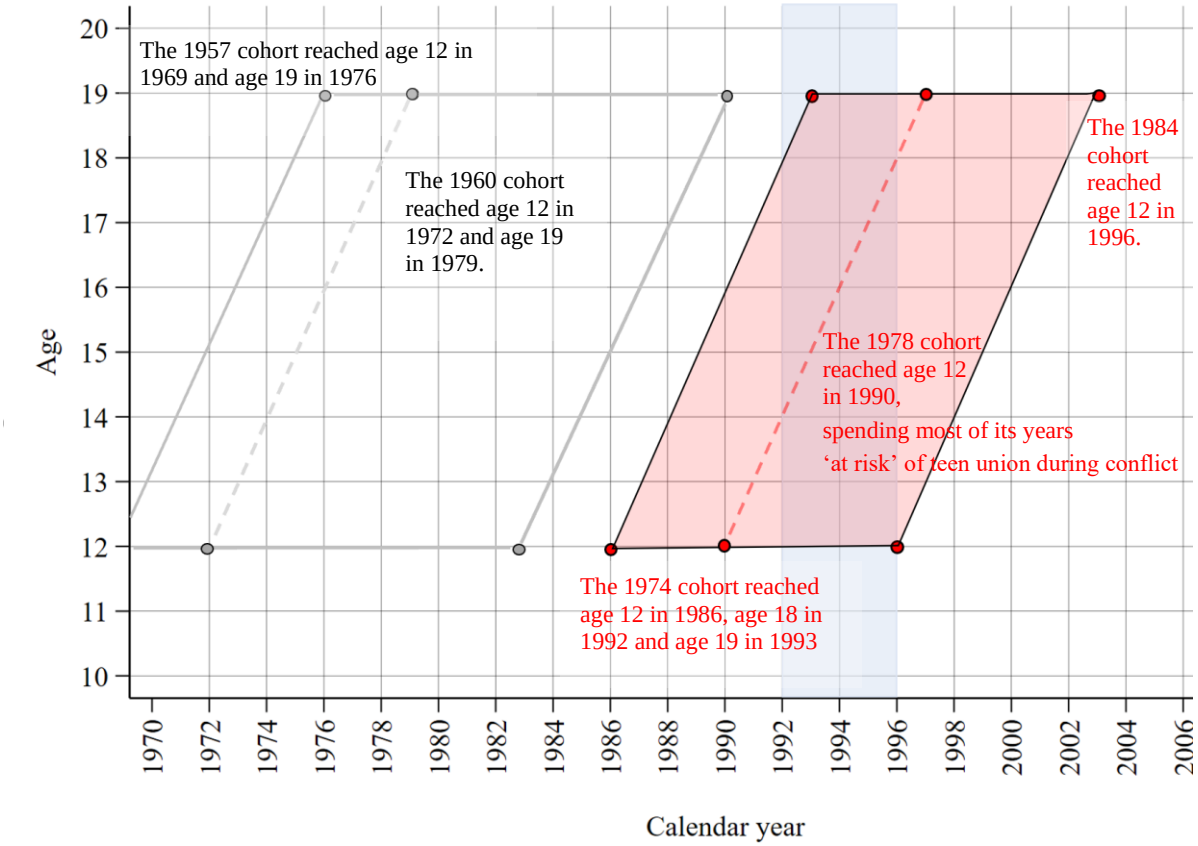
Source: 2006 AZ-DHS. Notes: All indicators are presented using provided sample weights.

Table A3.4 Discrete-time clog-log models of the transition to teen marriage with granular cohorts and migration status

	HR of teen union
	(1)
Conflict migration status * Born in	
IDP/refugee *	
1974-1977	0.810
	[0.44,1.49]
1978-1980	0.331**
	[0.15,0.73]
1981-1984	0.693
	[0.37,1.28]
Non-migrant in Upper-Karabakh *	
1974-1977	1.362
	[0.55,3.37]
1978-1980	0.256*
	[0.25,0.98]
1981-1984	0.182*
	[0.04,0.87]
Overall conflict-exposure (ref: Not-exposed)	
IDP/refugee	1.323
	[0.69,2.52]
Non-migrant in Upper-Karabakh	1.163
	[0.72,1.88]
District FE	Yes
Year of birth FE	Yes
Controls	Yes
σ_u^2	1.169
N person-years	44,885

Source: 2006 AZ-DHS. Notes: Sample consists of women born during 1957–1984 (ages 22–49 in 2006), excluding women born 1972-1973. Subjects enter analysis at age 12. Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at the PSU level. The "War-cohort" includes women born 1974-1984. Non-migrants in Upper-Karabakh include women who always resided (or migrated pre-conflict or during conflict) in the Azerbaijani controlled parts of the contested districts of Agdam, Fizuli and Terter. All regressions control for duration since start of exposure to the risk of teen marriage (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Models are specified with individual-level frailty terms (σ_u^2) and are weighted using provided sampling weights. * p<0.05, ** p<0.01, *** p<0.001.

Figure A3.1 Lexis visualisation of women's attained ages during conflict years



Notes: The blue rectangle shows the core conflict years (1992-1996). The grey parallelogram indicates the 'Soviet cohort' (born 1957-1971), i.e., women who were 21+ before conflict onset. These women were too old to have their teen marriage outcomes affected by the conflict. The red parallelogram highlights attained ages in each calendar period for the 'War-cohorts' (1974-1984), i.e., for women who turned 12-19 during the core conflict years. As explained in the text, the cohorts aged 19-20 in 1992 (born 1973-1972) are excluded in the main analyses as their "conflict-exposure" status is less clear-cut.

3.11 Appendix B

Appendix B contains supplementary material detailing (a) assumption checks in support to the difference-in-difference logic applied in the analyses, including balance of covariates and parallel trends (Tables B3.1-B3.3); (b) results from alternative model specifications, including alternative cohort grouping (Tables B3.4-B3.6) and conflict measures (Table B3.7).

3.13.1 Preliminary checks

3.13.1.1 Balance in War- and Soviet-cohort characteristics

A preliminary concern is the possibility that older and younger cohorts differ systematically and in relation to the conflict (selection into treatment). One way of testing this would be analysing whether the origin households of slightly younger and slightly older women were similar in terms of various characteristics, including conflict-exposure. Unfortunately, the AZ-DHS offers limited information on women's natal households and does so only for those – whether married or not – who were still living with their origin families at survey time. These are predominantly the youngest respondents. Alternatively, one can look at whether all younger and older women are similar at least in terms of observable characteristics. I follow both approaches for completeness. Table B1 shows the distribution or means of several observable characteristics for women in the *Soviet* vs. *War-cohorts*, while Table B2 for women still living with their origin household (*N*=1,274).

There is a substantial balance across covariates between the *Soviet cohort* and the *War-cohort*, regardless of whether they still live with their origin family. In Table B1, the only significant difference is observed in the age variable which is expected by default. This strengthens the interpretability of results. In Table B2 (women still residing with their natal household in 2006), the only other notable difference is in household wealth, which favours the *War-cohort*. This might suggest that girls in the *War-cohort* were somehow wealthier than older cohorts and thus, if affected by the conflict, their families could afford to keep them within the household rather than "cashing them in" to prospective husbands. However, these covariates were all measured in 2006 and there is no way to know whether responses for characteristics like wealth changed over time and compared

to the conflict years. Furthermore, women still residing with their origin family at survey time, especially older ones, are likely to be a selected group and hence not necessarily displaying an accurate pattern. For these reasons, I do not control for household wealth in the main models. Even when included, results do not change substantively in all model specifications.

Table B3.1 Descriptive statistics of Soviet and War-cohorts

	Cohort				
	1957-1971 ("Soviet")		**1974-1984 ("War")**		
	N	Mean or %	*N*	Mean or %	*p-value*
Conflict frequency (events)	3,469	1.96	2,542	1.99	
Conflict intensity (fatalities per 1,000)	3,469	0.54	2,542	0.59	
Overall conflict-exposure					
Not-exposed	3,107	88.56%	2,260	88.94%	
Conflict-exposed	362	10.44%	282	11.06%	
Age	3,469	41.48	2,542	26.35	***
Years of education	3,469	10.88	2,542	11.00	
Household wealth					
Poor	1,336	38.50%	947	37.26%	
Middle	674	19.44%	534	21.00%	
Rich	1,459	42.06%	1,061	41.74%	
Residence type					
Rural	1,497	43.17%	1,103	43.36%	
Urban	1,972	56.83%	1,439	56.64%	
Ethnicity					
Azerbaijani	3,256	93.85%	2,397	94.28%	
Talish	67	1.92%	40	1.59%	
Lesgin	48	1.40%	38	1.48%	
Russian	22	0.63%	5	0.21%	
Other	76	2.20%	62	2.44%	
Religion					
Muslim	3,435	99.01%	2,531	99.24%	
Other	34	0.99%	11	0.76%	
Married in teen ages					
Yes	2,478	14.33%	855	24.38%	***
No	991	85.67%	1,687	75.62%	
Married by 15					
Yes	32	0.90%	73	2.85%	***
No	3,437	99.10%	2,469	97.15%	
Married by 16					
Yes	76	2.16%	206	8.05%	***
No	3,395	97.84%	2,336	91.95%	
Married by 17					
Yes	274	7.90%	401	15.76%	***
No	3,195	92.10%	2,141	84.24%	
Married by 18					
Yes	618	17.82%	611	24.00%	***
No	2,851	82.18%	1,931	76.00%	

Source: 2006 AZ-DHS. Notes: Weighted observations. * p<0.05, ** p<0.01, *** p<0.001.

Table B3.2 Descriptive characteristics of women of Soviet and War-cohorts living with their origin households in 2006

	Cohort				
	1957-1971 ("Soviet")		1974-1984 ("War")		
	N	Mean or %	*N*	Mean or %	*p-value*
Conflict frequency (events)	424	2.09	850	1.74	
Conflict intensity (fatalities per 1,000)	424	0.57	850	0.53	
Overall conflict exposure					
Not-exposed	377	88.82%	761	89.53%	
Exposed	47	11.18%	89	10.47%	
Age	424	39.78	850	25.31	***
Years of education	424	10.71	850	11.51	
Number of household members	424	5.52	850	5.37	
Household wealth					
Poor	204	48.06%	284	33.43%	**
Middle	73	17.23%	173	20.38%	
Rich	147	34.71%	393	46.18%	
Residence type					
Rural	219	48.44%	499	41.20%	
Urban	205	51.56%	351	58.80%	
Ethnicity					
Azerbaijani	395	92.96%	802	94.32%	
Talish	7	1.70%	12	1.43%	
Russian	8	1.90%	2	0.20%	
Other	14	3.44%	34	4.05%	
Religion					
Muslim	415	97.86%	845	99.38%	
Other	9	2.14%	5	0.62%	
Married in teen ages					
Yes	39	9.14%	74	8.76%	
No	385	90.86%	776	91.24%	
Married by 15					
Yes	3	0.71%	10	1.13%	
No	421	99.29%	840	98.87%	
Married by 16					
Yes	6	1.48%	30	3.58%	
No	418	98.52%	820	96.42%	
Married by 17					
Yes	9	2.10%	45	5.23%	*
No	415	97.90%	805	94.77%	
Married by 18					
Yes	19	4.44%	57	6.66%	
No	405	95.56%	793	93.34%	

Source: 2006 AZ-DHS. Notes: Weighted observations. * p<0.05, ** p<0.01, *** p<0.001

3.13.1.2 Placebo test

Figure 3 in the main text provides suggestive evidence that trends in teen marriage would have been the same for affected and Not-exposed in the absence of conflict. As an additional test, I follow Valente (2011) and re-estimate Equation (1) replacing the $War\text{-}Cohort_{ik}$ indicator in the interaction term with a set of dummies for the five youngest cohorts who, due to their year of birth, could not have had their teen marriage patterns affected by conflict ($1967 \leq k \leq 1971$). These models are then estimated on the sample of the oldest ten *Soviet cohorts* i.e., women born between 1961-1971. The interaction terms between each of the five youngest cohorts and each conflict indicator are not jointly nor individually significant, suggesting no systematic differences in pre-conflict early marriage trends between groups with *future* different exposure to the conflict. Models run on the full counterfactual sample (born 1957-1971) yielded similar estimates. Additionally, these results help dismiss the possibility that the main findings are driven by events that occurred before conflict onset. Table B3.3 reports the full results of this "placebo" experiment

Table B3.3 Test for pre-conflict difference in early marriage

Sample: Born 1961-1971

	Overall conflict-exposure	**Conflict frequency (events)**	**Conflict intensity (fatalities per 1,000)**
Age in 1992 * Conflict measure			
25 (born 1967) * Conflict measure	0.97 [0.41,2.30]	1.01 [0.97,1.05]	1.01 [0.87,1.18]
24 (born 1968) * Conflict measure	0.85 [0.29,2.47]	0.99 [0.94,1.04]	0.96 [0.79,1.16]
23 (born 1969) * Conflict measure	0.84 [0.29,2.43]	0.99 [0.95,1.05]	0.98 [0.82,1.17]
22 (born 1970) * Conflict measure	1.68 [0.72,3.93]	1.02 [0.98,1.06]	1.08 [0.94,1.24]
21 (born 1971) * Conflict measure	0.58 [0.22,1.56]	0.97 [0.94,1.04]	0.95 [0.80,1.14]
District FE	Yes	Yes	Yes
Year of birth FE	Yes	Yes	Yes
***N* Person-years**	20,597	20,597	20,597
F-test pre-conflict trend difference	0.658	0.720	0.836

Source: 2006 AZ-DHS. Notes: Sample consists of women born 1961–1971 (ages 35–45 in 2006 and 21–31 at the start of the conflict in 1992). Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at PSU level are in parentheses. Reference category for the cohort measure is "Born in 1961-1966". The binary indicator "overall conflict-exposure" includes IDP/refugee women, non-migrant women residing in Upper-Karabakh and non-displaced women with at least one member of their family of origin who identified as IDP/refugee. All regressions are specified with frailty terms (σ_u^2) at the individual level. Models control for duration since start of exposure to the risk of teen marriage (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Subjects enter analysis at age 12. * p<0.05, ** p<0.01, *** p<0.001.

Table B3.4 Discrete-time clog-log models of the transition to teen marriage using alternative (restricted) control group

	HR of teen union		
	(1)	(2)	(3)
War-cohort (1974-1984) * Conflict measure	0.565*	0.979*	0.931*
	[0.37,0.87]	[0.96,0.99]	[0.87,0.99]
Overall conflict-exposure (ref: Not-exposed)			
Conflict-exposed	1.465		
	[0.81,2.63]		
Conflict frequency (events)		1.037*	
		[1.01.1.07]	
Conflict intensity (fatalities per 1,000)			1.091
			[0.94,1.27]
District FE	Yes	Yes	Yes
Year of birth FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
σ_u^2	1.100	1.104	0.740
N person-years	38,934	38,934	38,934

Source: 2006 AZ-DHS. Notes: Sample consists of women born 1961–1984 (ages 22–45 in 2006), excluding women born 1972-1973. Subjects enter analysis at age 12. Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at the PSU level. The "War-cohort" includes women born 1974-1984. The binary indicator "overall conflict-exposure" includes IDP/refugee women, non-migrant women residing in Upper-Karabakh and non-displaced women with at least one member of their family of origin who identified as IDP/refugee. All regressions control for duration since start of exposure to the risk of teen marriage (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Models are specified with individual-level frailty terms (σ_u^2) and are weighted using provided sampling weights. * p<0.05, ** p<0.01, *** p<0.001.

Table B3.5 Discrete-time clog-log models of the transition to teen marriage including 1972-1973 cohorts (both coded as 'Soviet cohorts')

	HR of teen union		
	(1)	(2)	(3)
War-cohort (1974-1984) * Conflict measure	0.560**	0.979**	0.928*
	[0.55,0.81]	[0.96,0.98]	[0.87,0.99]
Overall conflict-exposure (ref: Not-exposed)			
Conflict-exposed	1.333		
	[0.81,2.20]		
Conflict frequency (events)		1.037*	
		[1.01,1.07]	
Conflict intensity (fatalities per 1,000)			1.104
			[0.98,1.24]
District FE	Yes	Yes	Yes
Year of birth FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
σ_u^2	0.796	1.125	0.668
N person-years	47,960	47,960	47,960

Source: 2006 AZ-DHS. Notes: Sample consists of women born 1957–1984 (ages 22–49 in 2006), including women born 1972-1973. Subjects enter analysis at age 12. Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at the PSU level. The "War-cohort" includes women born 1974-1984. The binary indicator "overall conflict-exposure" includes IDP/refugee women, non-migrant women residing in Upper-Karabakh and non-displaced women with at least one member of their family of origin who identified as IDP/refugee. All regressions control for duration since start of exposure to the risk of teen marriage (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Models are specified with individual-level frailty terms (σ_u^2) and are weighted using provided sampling weights. * p<0.05, ** p<0.01, *** p<0.001.

Table B3.6 Discrete-time clog-log models of the transition to teen marriage including 1972-1973 cohorts (1973 coded as 'War-cohort')

	HR of teen union		
	(1)	(2)	(3)
War-cohort (1973-1984) * Conflict measure	0.690*	0.985*	0.948*
	[0.47,0.98]	[0.97,0.99]	[0.89,0.99]
Overall conflict-exposure (ref: Not-exposed)			
Conflict-exposed	1.243		
	[0.75,2.05]		
Conflict frequency (events)		1.035*	
		[1.01,1.07]	
Conflict intensity (fatalities per 1,000)			1.098
			[0.98,1.23]
District FE	Yes	Yes	Yes
Year of birth FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
σ_u^2	1.127	1.144	1.093
N person-years	47,960	47,960	47,960

Source: 2006 AZ-DHS. Notes: Sample consists of women born during 1957–1984 (ages 22–49 in 2006), including women born 1972-1973. Subjects enter analysis at age 12. Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at the PSU level. The "War-cohort" includes women born 1974-1984. The binary indicator "overall conflict-exposure" includes IDP/refugee women, non-migrant women residing in Upper-Karabakh and non-displaced women with at least one member of their family of origin who identified as IDP/refugee. All regressions control for duration since start of exposure to the risk of teen marriage (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Models are specified with individual-level frailty terms (σ_u^2) and are weighted using provided sampling weights. * p<0.05, ** p<0.01, *** p<0.001.

Table B3.7 Discrete-time clog-log models of the transition to teen marriage using categorical conflict frequency and intensity indicators

	HR of teen union	
	(1)	(2)
War-cohort (1974-1984) * Conflict frequency (events)		
Medium (<25)	0.641* [0.41,0.98]	
High (25+)	0.619 [0.25,1.50]	
Number of conflict events		
Medium (<25)	1.571 [0.74,3.34]	
High (25+)	1.006 [0.37,2.73]	
War-cohort (1974-1984) * Conflict frequency (fatalities per 1,000)		
Medium (<6 per 1,000)		0.544* [0.28,0.94]
High (6+ per 1,000)		0.852* [0.49,0.97]
Number of conflict fatalities		
Medium		0.883 [0.53,1.92]
High		1.836 [0.98,3.45]
District FE	Yes	Yes
Year of birth FE	Yes	Yes
Controls	Yes	Yes
σ_u^2	1.346	1.237
N person-years	44,885	44,885

Source: 2006 AZ-DHS. Notes: Reference categories: "No conflict events", "No conflict fatalities". "Medium" (between 1 and the 95th percentile) and "High" (above the 95th percentile). Sample consists of women born during 1957–1984 (ages 22–49 in 2006), excluding women born 1972-1973. Subjects enter analysis at age 12. Columns represent hazard ratios. 95% confidence intervals are in parentheses. Robust standard errors clustered at the PSU level. Conflict-exposure and War-cohort variables as per Data and measures section. All regressions control for duration since start of exposure (<5 years, 5-6 years and >6 years) and rural/urban residence, and include a constant not shown. Models are specified with individual-level frailty terms (σ_u^2) and are weighted using provided sampling weights. * p<0.05, ** p<0.01, *** p<0.001.

Chapter 4

Young-age exposure to armed conflict and women's experiences of intimate partner violence*

4.1 Introduction

Armed conflict and intimate partner violence (IPV) are among the most widespread and severe forms of violence, and women and children are especially vulnerable (Heise and Garcia-Moreno 2002; Kadir et al. 2019). Not only do both types of violence account for a significant burden of mortality and morbidity worldwide, but their adverse consequences are often protracted, extending beyond the health and well-being of victims to communities and future generations (Devries et al. 2013; Ghobarah et al. 2003).

Although there is evidence that war exacerbates IPV, most comes from research on military personnel returned from deployment and thus generally reflects men's experiences and perpetration (Galovski and Lyons 2004; Taft et al. 2011). Only recently research has started to focus on civilian populations

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– the overwhelming majority of those affected by war – and on IPV victims, documenting a correlation between levels of armed violence and women's domestic victimisation (Kelly et al. 2018; La Mattina 2017; Østby 2016; Svallfors 2021b). Some studies even suggest that IPV is the most prevalent form of gender-based violence in conflict settings (Stark and Ager 2011; Swaine 2015). This shift in focus is significant for two reasons. First, by hinging on victims' reporting, which is typically more reliable than perpetrators' (Anderson 2013; Armstrong et al. 2002), these studies draw attention to the most vulnerable, namely those women at risk of double-victimisation – from conflict and from partners – and to cumulative trauma. Second, their findings suggest a spread of violence across social spaces in war-affected civilian populations, beyond those directly involved in combat. However, this novel research strand has focused primarily on the co-occurrence of IPV and armed violence, leaving much unknown about plausible drivers and *how long* this relationship may last.

In this regard, considering *when* over the life-course conflict happens is crucial because the age at exposure to shocks matters, particularly when traumatic events occur in childhood and adolescence. Ample research on the determinants of IPV has shown that victimisation in adult unions is greater when victims have experienced other kinds of violence (e.g., within the family, in schools and neighbourhoods) in early life (Bandura 1977; Widom 1989). It also is well-established that the consequences of war are particularly profound when conflict stressors occur in developmental ages, with girls and boys suffering harm that persists long after the fighting has ceased (Kadir et al. 2019; Krug et al. 2002; Schneider et al. 2021). Examining the link between armed and domestic violence with a focus on the ages at war exposure is thus necessary to understand the lasting consequences of conflict on the family domain, beyond contemporaneous relationships. Put differently, to know if IPV is another long-term by-product of war. Shedding light on this is vital for structuring timely interventions, and for achieving human security, peace, and gender equality.

This study provides a first systematic examination of the relationship between conflict exposure in 'sensitive' ages and women's adult IPV risk, exploiting the armed confrontations that occurred soon after the USSR dissolution in Armenia, Azerbaijan, Moldova, and Tajikistan. These countries have a similar conflict history, with wars happening simultaneously and affecting the same cohorts. Their

populations further shared the same pre-independence institutional background and social-value system. Importantly, all four countries have been indexed by human rights organisations as having the highest IPV levels in Eurasia and major deficits in related legislation (Amnesty International 2008, 2009; HRW 2019). Yet, research on IPV here remains scarce, especially in its links with war violence.

In addition, of the only two studies (both unpublished) that have discussed the age at war exposure in relation to women's IPV risk, one provided deep, but context-specific evidence of greater domestic victimisation associated with young-age conflict exposure (Gutierrez and Gallegos (2016) on Peru); the other evaluated the relationship with cross-country data on contexts with diverse backgrounds and conflict typologies (La Mattina and Shemyakina (2017) on sub-Saharan Africa), and measured conflict exposure with broad region-level indicators, which may mask a good amount of heterogeneity in women's actual exposure to war. Using high-quality and comparable data for cross-national analyses, this study improves prior research on this topic by constructing narrower conflict measures that permit testing if close exposure to conflict events, not (only) diffused regional instability, is predictive of future victimisation. Understanding if proximity to war matters for long-term outcomes matters to identifying plausible pathways and for the development of strategies that can break these associations. In this sense, this article further contributes by considering the role of men, including changes in their behaviour as fathers in wartime and in attitudes towards IPV as partners following conflict exposure, as potential mechanisms driving the relationship between women's young-age conflict exposure and later IPV victimisation.

I combine cross-country data on IPV from available Demographic and Health Surveys and geo-referenced information on armed conflict from the UCDP-GED. Using linear models with fixed effects and exploiting cohort and geographic variation in war exposure, I find that women exposed to conflict by age 19 are more likely to experience IPV than those never exposed and not-exposed by age 19. Further analyses reveal that the result is driven by conflict exposure in childhood ages (0-10). The link is particularly pronounced for physical forms of IPV. Findings are equivalent for life-time and past-year IPV, suggesting that the imprints left by conflict may not wane much over time. They are also robust to checks, consistent at the country-level and are not driven by selective migration.

Analyses of testable mechanisms show that neither conflict-related changes in marriage market conditions (education, marriage timing, spousal age difference) nor in attitudes towards domestic violence in women exposed to war when young explain the results. Conversely, I find that women exposed to conflict in childhood are more likely to have a violent father, and that war correlates with views condoning IPV in men who experienced armed violence in their late teens (16-19). Taken together, these findings not only confirm that war can have 'immediate' adverse implications for men's behaviour in the domestic realm; they also suggest that, when conflict violence is experienced at young ages, it can carry lasting consequences on men's attitudes towards IPV, 'normalising' the use of aggressive behaviour as a standard resolution strategy for private adult disputes. In turn, this can exacerbate women's risk of victimisation.

This study broadens our theoretical knowledge on the long-term consequences of war on individuals, the family and society at large, which so far overlooked implications for family violence and the formation of attitudes towards IPV. It further expands our understanding of how proximal and early-age exposure to shocks together influence later-life outcomes and casts light on women's risk of double-victimisation and cumulative trauma. Results are also policy-relevant in that they suggest that interventions targeting very young girls and adolescent boys affected by war, as well as their (male) caregivers may be promising to prevent IPV and interrupt 'cycles' of violence.

4.2 Background

4.2.1 Armed conflict and IPV: What relationship?

Exposure to war has been related to later violence in intimate relationships. Yet, evidence mostly comes from studies on combatants returned from deployment. As such, it focuses on future perpetration and on men, who are more likely to both serve in armies and commit violent acts against partners (Cesur and Sabia 2016; Galovski and Lyons 2004; Taft et al. 2011). Research on civilian populations (which may include some ex-soldiers) and victimisation is scarcer, though increasingly studies show a positive correlation between levels of armed and domestic violence in some conflict and post-conflict settings (Ekhator-Mobayode et al. (2022); Kelly et al. (2018); La Mattina (2017);

Østby (2016) in sub-Saharan Africa; Noe and Rieckmann (2013); Svallfors (2021b) in Latin America).

This emergent line of scholarship has the merit of having drawn attention to civilians and women's risk of double-victimisation – the first due to exposure to conflict and the second to abuse within the home during/after war. Moreover, it offers supporting evidence on the *transmissibility* of violence across social spaces (Dubow et al. 2009; Kelly et al. 2018). Essentially though, most existing studies capture the co-occurrence of both forms of violence or early post-war correlations. Thus, due to their designs and focus on establishing a general association, they do not consider the age at conflict exposure and, therefore cannot ascertain any potential long-term effect.

The age at exposure to violence is, though, salient when it comes to IPV. Ample literature indicates young-age experiences of various forms of violence other than war – including in the parental house, schools, and local communities – as harbingers of 'cycles of violence' and as strong determinants of one's future risk of IPV victimisation and/or perpetration (Arata 2000; Bandura 1977; Desai et al. 2002; Widom 1989). As armed conflict is a highly pervasive and disruptive form of violence, there are theoretical reasons to hypothesise that young-age exposure to war may as well have lasting implications for IPV outcomes (Dubow 2013).

To date, just two studies have approached the relationship considering the ages at war exposure. In Peru, Gallegos and Gutierrez (2016) found that women who resided in conflict areas when aged 0-16 had an elevated risk of domestic victimisation in later life compared to those who were not exposed to conflict violence. La Mattina and Shemyakina (2017), pooling data from sub-Saharan Africa and measuring conflict with a broad region-level indicator, documented higher adult IPV rates for women who lived in war-affected regions between ages 6-10. These findings provide small, but valuable indications of the long-term link between the two types of violence, and which relationship we can expect elsewhere.

4.2.2 What may explain the link?

Many possible interrelated pathways may explain why conflict violence experienced in early ages

can have implications for later victimisation in the home (Heise 1998). First, armed conflict may increase known individual-level predictors of IPV (Gibbs et al. 2020). Wars expose girls to a myriad of stressors either as witnesses, perpetrators and/or victims. These experiences often leave scars on mental health and cause lasting post-traumatic stress that can elevate their future risk of IPV. For example, re-experiencing symptoms of post-traumatic stress disorder may trigger strong negative affects, causing war victims to be aggressive towards partners, which in turn increases their risk of victimisation (Kuijpers et al. 2012). Alternatively, symptoms of emotional numbing can increase the likelihood of victimisation by inhibiting negative feelings, e.g., anticipatory anxiety connected to threat cues, and thus may impede risk recognition and reaction to dangers (Krause et al. 2006; Jewkes et al. 2017). Conflict-related trauma can prompt maladaptive coping mechanisms, e.g., alcohol and substance misuse, in adult life (Brecklin 2002; Lo et al. 2017). These health behaviours are known risk factors for violence perpetration, but research has shown that they can also increase women's vulnerability to victimisation due, for example, to a greater likelihood of finding partners with similar consumption patterns and, again, to impaired cognition and weakened capacity to distinguish dangerous situations (Felson and Burchfield 2004; Nowotny and Graves 2011; Testa and Livingstone 2009; Weinsheimer et al. 2005). Armed violence also worsens girls' educational outcomes due to infrastructure disruption and security concerns (Kadir et al. 2019). Reduced education can then negatively affect knowledge and attitude formation, as well as women's participation in income-generating activities, thereby raising their chances of having and staying in abusive relationships (Anderberg et al. 2016; Heise and Garcia-Moreno 2002).

Another key route may run through increased exposure to family violence. As mentioned above, prior work has shown that levels of conflict violence are simultaneously related to increasing IPV (e.g., Kelly et al. 2018). At the same time, life-course research and sociological studies on family violence argue that, since the natal family is often girls' first focal unit of socialisation, early exposure to parental violence can 'corrupt' their cognitive schemas about the role of violence in future intimate unions them, elevating their risk of victimisation in adult private relationships (Cappel and Heiner 1990; Pollak 2004; Putney and Bengtson 2002). In this regard, childhood appears to be the critical

period for lasting harm because of the limited means infants and young girls possess to avoid and deal with the shock at exposure time, while also being highly dependent on the abuser for survival (Gustafsson and Cox 2016; Holt et al. 2008). Hence, if war makes parents more prone to use force against each other or their daughters, there is reason to expect that violence may spread intergenerationally and manifestly so for women experiencing both armed and familial violence in early ages.

As IPV is an inherently relational event, these factors are likely magnified at the couple-level and influenced by the community characteristics where unions are formed (Behrman and Frye 2021). For instance, if conflict-related education losses or mortality in a community hit boys hardest, this may generate a "surplus" of women facing a smaller group of prospective grooms of equivalent age/education and greater competition in the marriage market. Imbalances in sex-ratio and/or educational attainment may elicit early unions and reduce match quality, with consequences for women's intra-household bargaining power, marital discord and IPV (La Mattina 2017). Conflict-exposed women may also marry men who were too exposed to conflict in young ages. If these men suffer from conflict-related poor mental health, for the presented reasons above, they could be more likely to be violent against their female partners (Taft et al. 2011).

The extent to which the above channels unfold finally relates to how armed conflict shapes the broader social environment. The erosion of kinship structures and social networks, the deterioration of health infrastructures and judiciary systems that could otherwise deter interpersonal violence can increase women's vulnerability to IPV (Kelly et al. 2018). Conflict generates poverty, high and enduring unemployment, which have been linked to a greater risk of interpersonal victimisation (Schneider et al. 2016). Moreover, if conflict induces structural changes in traditional gender norms, men may resort to violence in the home to respond to their perception of power asymmetries in the society (Stryker and Macke 1978).

A last macro-level avenue bridging conflict and spousal violence springs from an increased legitimisation of the use of violence in the society. According to *cultural spillover theory*, the more a

society culturally endorses the use of force to attain its goals, the more this blurs the boundaries between legitimate/illegitimate actions, and allows violence to be justified in spheres of life where it would commonly be considered inappropriate, including the domestic realm (Baron et al. 1988; Straus 1991). Therefore, exposure to war could alter the normative understanding of (in)opportune social behaviour and trigger 'cultures of violence' where force is tolerated (Jewkes 2002). This process can be expected especially when conflict exposure happens in key ages of physical and emotional development because, as *social learning theory* posits, violence is a learned behaviour: once experienced in early life (either as a victim or witness), it is often carried onto adulthood and internalised as the conventional way to solve disputes, even in private relationships (Cappel and Heiner 1990; Pollak 2004). In this sense, child development theory points at adolescence as a particularly susceptible period because it is at this life-stage that attitudes and behavioural norms are deemed to develop, to then remain often fixed thereafter (Krosnick and Alwin 1989). In the context of male-to-female interpersonal violence, the legitimisation can be expected to occur in two gender-specific ways. In male perpetrators, in the form of a '*normalisation*' of violence, which makes of aggression an adaptive behaviour and the standard means to resolve private issues (Dodge et al. 1990; Dubow 2013). In particular, given men's greater direct involvement and proximate confrontation with war violence, conflict exposure at young ages can encourage men to adopt violent models of masculinity, socialise them to view violent behaviour as increasingly less inappropriate and eventually 'neutralise' their natural barriers to acting violently, even against partners later in life (Grossman 2018; Mendelsohn and Straker 1998). In female victims, violence legitimisation can instead be expected to occur as a process of '*desensitisation*' to abuse – a form non-associative learning that lowers reaction to a stimulus after repeated exposure – which can escalate their vulnerability to re-victimisation (Noe and Rieckmann 2013).

Overall, given the scant empirical evidence on the relationship, my first aim is to determine as neatly as possible if experiencing conflict violence at young age is associated with women's later IPV victimisation. Next, although assessing all possible channels of this vicious 'cycle' is not possible, I examine some to provide suggestive insights on entry points for intervention.

4.3 The contexts

4.3.1 Armed conflicts in the post-Soviet space

The fall of the USSR led to the establishment of successor states often characterised by fluid borders and substantial ethnolinguistic diversity that, in three cases unleashed long-suppressed hostility.

The first major conflict emerged between Azerbaijan and Armenia over Nagorno-Karabakh, a mountainous region officially recognised as part of the former, but which the latter considers an Armenian historical area of residence (UN Security Council 1993a-d). The full-blown conflict began in 1992, when the separatist region proclaimed independence from Azerbaijan with Armenian support (HRW 1992, 1994). Most fighting took place in and around the territories of the seceding region and at the borders between Armenia and Azerbaijan, whereas other areas in both countries remained largely untouched by violent events. Although no precise and independently verified figures exist, it has been estimated that the conflict claimed between 10-25,000 lives, including many conscripted men, and caused the displacement of over 750,000 (de Waal 2019; HRW 1994, 1992; Yunusov 2002). An open-ended ceasefire was agreed upon in 1994, resulting in a *de facto* jurisdiction, the Republic of Karabakh (or Artsakh). Since then, the conflict has been described as "frozen" and intermittent intimidations still characterise the relationship between the countries (de Wall 2019).

A comparable separatist logic triggered the conflict between Moldova and the Russian-speaking enclave of Transnistria. After the Soviet dissolution, the Moldovan government declared Romanian the official state language to promote Romanian identity and break with its Soviet past (Roper 2001). Slavic and Russian-speaking groups in Transnistria opposed these initiatives, fearing loss of socio-cultural rights. Initial disagreement translated into all-out conflict in 1992 that, similar to Nagorno-Karabakh, terminated without a peace agreement, but only with a ceasefire and the breakaway region's self-declared independence (CSCE 1993). Although fighting was localised near the banks of the Dniester River and was short in duration, it caused an estimated 1,500-2,000 deaths, more than 50,000 displaced and infrastructural damage to roads and bridges that disrupted the country's already small internal market and put additional strain on its fragile economy (IDMC 2004; Gorelova and

Şelari 2009; UCDP-GED 2022; World Bank 1998).

The third major conflict erupted in Tajikistan, the poorest among ex-Soviet republics. Here, an internecine struggle for state control between ethno-regional and clannish rival groups marred the country between 1992-1997, when peace accords between the opposing factions ended the war. Although here conflict violence spread across the country, its intensity varied across geographic areas with the Southern and Central regions being disproportionately affected (Falkingham 2000). Children, and especially girls in these areas were often unable to attend school due to security concerns, leading to low illiteracy levels in the conflict-exposed cohorts (Shemyakina 2011). The war killed over 50,000 people, mostly male fighters, displaced more than 600,000 and exacerbated already widespread poverty (ICG 2001).

All these conflicts occurred amid the dramatic political and socio-economic transformations ushered by the Soviet collapse, which themselves alone influenced gender and family dynamics. In all four countries, the severe economic downturn pushed women out from (paid) economic activities, despite their high educational levels, whilst the burden of survival shifted primarily to the family unit (Falkingham 2000; Fertaly 2018; Heyat 2004). Having to acclimate to their new national identities, post-Soviet families were further disoriented by the elimination of state-funded social services, on which women in particular relied for childcare provisions in Soviet times (UNICEF 1999). Importantly, the fall of the socialist regimes itself fuelled a revival of nationalist and conservative sentiments, while it also dismantled the idea of (formal) gender equality. Together, this led to a quick 're-domestication' of women and a restoration of patriarchal family values, to which then conflicts provided fuel (Gal and Kligman 2012). For example, evidence suggests that in Armenia and Azerbaijan the war and its unsettled status further imbued these increasingly patriarchal post-Soviet societies with nationalist rhetoric celebrating male fighters as heroic "martyrs" and "protectors of national identities" and relegating the value of women to their role of wives and mothers of future defenders (Fertaly 2018; Ishkanian 2007; Twum et al. 2019). Similarly, it has been argued that the Tajik civil conflict accelerated and fed the re-emergence of conservative customs and traditional family arrangements during the process of post-Soviet nation-building, creating fertile grounds for

community violence in communities and the private realm (Heathershaw 2009; Thibault 2018).

Overall, although each conflict had its distinct dynamics in terms of duration, deaths, and violent events (Figure A4.1), all stemmed from the dysfunctionalities and collapse of the same socio-economic institutions, erupted, and peaked in the same years of major socio-political transformations, leaving scars on the socialising behaviours of those affected.

4.3.2 Intimate partner violence in former Soviet conflict-affected countries

Research on the prevalence and correlates of IPV in the former Soviet bloc is scarce, particularly in countries marred by post-independence conflicts. This lack of attention is likely due to limited data, a popular understanding of IPV as a private matter, and cultural factors, including tensions between patriarchal values and the Soviet equalising ideals (Ismayilova 2015; UNFPA 2015).

Extant evidence from international agencies and research institutions though suggests that IPV represents a serious concern in these countries. According to regional research, more than a quarter of women in post-Soviet Eurasia report having experienced violence from partners at some point in life (Devries et al. 2013). The few existing national-level studies in the four conflict-affected countries in the area show similar values for Armenia, and higher estimates (about one-third) for Azerbaijan and Moldova (Ismayilova 2015; UN Women and WHO 2016). The issue appears especially severe in Tajikistan, where more than half of ever-partnered women report some form of domestic abuse during the life-time (Amnesty International 2009). Alarming as these estimates appear, they likely represent a fraction of the real extent of IPV in these settings and their precursors, including conflict violence, are still under-researched (UNFPA 2015).

4.4 Data and measures

4.4.1 IPV data and measures

The Demographic and Health Surveys (DHS) are the primary data source for this study. These are nationally representative surveys collecting various demographic, health, and family information from every woman aged 15-49 in households identified at the sampling stage. Increasingly, the

surveys include an IPV-focused module. This is administered to one randomly selected ever-partnered (married) woman in each household by a trained fieldworker via in-person interview, and asks questions that are comparable across countries and over time (Kishor and Johnson 2005)). Here, I combine into one dataset all available cross-sectional DHS collecting IPV data in the four countries of interest, namely one each from Armenia (2015), Azerbaijan (2006) and Moldova (2005), and two from Tajikistan (2012 and 2017). Data pooling allows for a larger sample with sufficient power to estimate associations for all forms of IPV. I also perform country-specific analyses to examine potential heterogeneity. The main sample comprises a total of 17,787 ever-partnered women. Nearly 45% comes from Tajikistan surveys (20% and 25%, respectively for 2012 and 2017), 21% from Moldova, 18% from Azerbaijan and 15% from Armenia (Table 4.1). Women with missing values on IPV-related questions (< 2%) and born after the end of each conflict (n=42) are excluded.

Alongside important background characteristics, women selected for the IPV module are asked if they have experienced various types of violent behaviours from their current (or most recent) partner, including physical, sexual, and psychological abuse, ever and in the 12 months preceding the interview (Table A4.1 for detailed questions). I use this information to construct progressively narrower measures of IPV, following the approach used in DHS reports, in the WHO multi-country study on IPV (Garcia-Moreno et al. 2006) and available studies of the association between armed and domestic violence (e.g., La Mattina and Shemyakina 2017). The first outcome measures if the woman ever experienced one or more acts of abuse (physical, sexual, psychological) from her partner. This captures the broadest association between the two "ever" experiences of violence (i.e., experienced conflict at young age and life-time IPV). Next, I build a similar indicator but which measures abuse the year before the survey. This serves to examine whether the association holds in the most recent temporal interval, and as a check for recall bias on violence endured in the more distant past (Devries et al. 2013). I then create separate measures for each form of life-time abuse (physical, sexual, and psychological). The former two are of special interest as considerably severe and damaging, and with more established connections to traumatic experiences of conflict violence (Straus et al. 2020). Finally, given that the IPV module asks women if they experience controlling behaviours from their

partners (e.g., not being allowed to see friends/family, being repeatedly asked where they are), I generate an additional outcome variable for whether the woman reported at least one controlling behaviour from her partner. This latter indicator is intended as supplementary and explores another aspect of relationship quality that might constrain women's autonomy. Note that in no way I seek to rank or classify abuses, nor do I underestimate the harm of non-physical assaults. For this reason, I examine all forms of IPV in their own right.

4.4.2 Conflict data and indicators

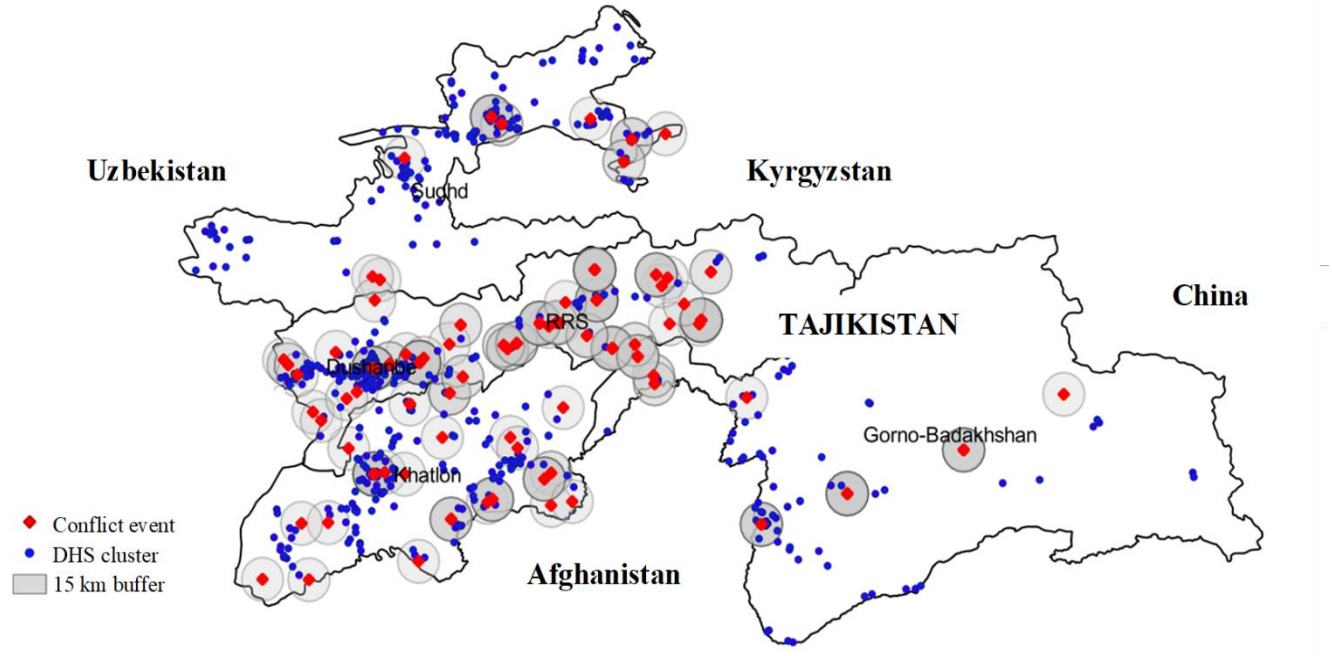
To determine if a respondent experienced armed violence, I primarily rely on conflict information from the UCDP Georeferenced Event Dataset (UCDP-GED). This is a high-quality public dataset providing spatial coordinates on conflict events happening worldwide (Croicu and Sundberg 2016).

To identify geographic areas affected by violence, I map conflict events recorded between January 1992 and the end/ceasefire of every conflict within the administrative boundaries of each country using UCDP-GED point coordinates. Then, to determine a "catchment" area for each event, I create circles ("buffers") of 15km in radius centred at the latitude/longitude of the conflict events. Next, for the DHS providing GPS data (Armenia, Moldova, and Tajikistan), I project survey cluster locations on the same map and geographically join them with conflict buffers. Figure 4.1 shows the procedure for Tajikistan. This strategy allows to identify women who at survey time were in clusters intersecting or contained in the "catchment" radius area of conflict events. I define them as conflict-exposed. Better model fit, assessed with Akaike's information criterion (AIC) and R-squared values, determined the choice of a binary indicator of conflict exposure based on conflict events (over continuous measures and/or fatality-based indicators). The recording of conflict events in the UCDP-GED is also, arguably, more precise than the number of fatalities (which come as low-, best-, high-estimates) caused by each event (Eck 2012).

The procedure differs for Azerbaijan as its DHS is not geocoded. Yet, a strength of this survey is that it offers special conflict-sensitive questions that allow identifying women affected by violence, their location and age when that occurred. Specifically, the survey provides information on the status of

refugee from Armenia or IDPs from Nagorno-Karabakh of each household member, his/her origin district if displaced from the disputed territories, and the duration of stay in the current place of residence. In the absence of GIS data, I use this set of variables to identify women affected by the conflict either because they lived in conflict-affected districts in Nagorno-Karabakh, in Armenia (forced to flee as a result) when young or because they resided since 1991 (i.e., before conflict onset) in the Eastern parts of the contested districts of Agdam, Fizuli and Terter. After the 1994 ceasefire, only the Eastern segments of these three districts remained under Azerbaijan's jurisdiction as parts of what, in Azeri language, is known as the Upper-Karabakh region (UN Security Council 1993a-d). The remainder was (until August 2020) controlled by Armenian-supported separatists as part of the *de facto* Republic of Nagorno-Karabakh/Artsakh and thus was not sampled in the Azerbaijan DHS. As a direct indicator of conflict exposure (and rare to come by in survey data), reported IDP/refugee status is the most suitable alternative to absent spatial data. Further, the small geographical size of Agdam (1.150km^2), Fizuli (1.390km^2) and Terter (957km^2) makes conflict exposure measured in terms of residence since 1991 comparable to a 15km buffer (see Figure A4.2).

Figure 4.1 Buffer (15km) around conflict events that occurred in 1991– 1997 in Tajikistan and DHS clusters (2012 and 2017)



Sources: Tajikistan (2012, 2017) DHS for survey clusters. UCDP-GED (2022) for conflict data. DIVA-GIS for map shapefile. Notes: The red diamonds represent conflict events; the grey circles their 15km catchment areas. Blue dots are DHS clusters. Of these, those falling inside or intersecting with the grey circles are considered conflict-affected clusters.

Table 4.1 Descriptive statistics for pooled and country-specific samples

Country	Survey year	*N* in pooled sample	%	Ever experienced IPV (%)	Past-year IPV (%)	Ever experienced (%)				Conflict exposure (%)				
						Physical violence	Sexual violence	Psychological violence	Controlling behaviour	Ever exposed	Ages			
											0-19	0-10	0-11	16-19
Armenia	2015	2,724	15.31	9.58	6.19	4.25	0.57	7.49	44.61	9.35	6.96	3.81	3.66	3.15
Azerbaijan	2006	3,186	17.91	11.49	10.26	8.51	1.78	4.44	84.41	12.04	5.76	1.73	3.42	4.03
Moldova	2005	3,773	21.21	28.10	26.19	17.81	3.14	20.05	65.13	4.71	2.10	0.72	0.74	0.63
Tajikistan	2012	3,646	20.51	24.22	20.51	15.49	4.26	11.23	76.01	60.12	51.30	28.75	21.09	15.49
Tajikistan	2017	4,458	25.06	29.50	24.66	22.63	1.44	14.73	82.11	69.27	57.08	40.76	20.15	16.32
Total sample		17,787	100	21.85	18.72	14.81	2.31	12.19	71.92	34.27	25.92	17.15	10.70	8.60

Source: Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: The sample includes women interviewed in the IPV module. Questions on IPV refer to the current partner for married women and the most recent partner for divorced, separated or widowed women. Observations are weighted using provided and rescaled sampling weights for selection into the IPV module.

4.5 Empirical strategy

I begin to study the relationship between young-age experiences of armed violence and later IPV with the following linear probability model:

$$Y_{ikdt} = \alpha + \beta_a Conflict_{kda} + \theta' X_i + \gamma_k + \delta_d + \varphi_{ct} + \varepsilon_{ikdt} \quad (1)$$

where Y_{ikdt} is an outcome (e.g., life-time, past-year IPV) for respondent *i* born in year *k* in district *d* at survey time (t). $Conflict_{kda}$ is a dichotomous indicator taking the value of 1 if a woman's cluster was affected by war (fell/intersected with a conflict event catchment "area") when she was of age *a*. This for Armenia, Moldova, and Tajikistan. For Azerbaijan, it takes the value of 1 for women born in year *k* who, when aged *a*, were in districts in Nagorno-Karabakh, in Armenia (then forced to flee), or lived in the contested districts of Agdam, Fizuli and Terter.

Following international definitions (Clark et al. 2020), I identify three critical age-periods for exposure to conflict: childhood (0-10), early adolescence (11-15) and late teen-ages (16-19). Interest in exposure at these specific stages is further motivated by the literature on child development, which identifies childhood (0-10) as the period most susceptible to the long-term effects of violent shocks, and adolescence (11-19) as a fundamental moment for one's attitude formation (Jonkman 2006; Howell et al. 2016; Krosnick and Alwin 1989). In specification (1), I combine them into a single variable so that the coefficient β_a measures the relationship between being exposed to war in early ages (i.e., by age 19) and the outcomes compared to not being exposed, either ever or by age 19. The focus is thus on the specific IPV trajectories of women who, above the regime transition, grew up additionally affected by war. The term X_i is a vector of individual-level controls, including respondents' educational level (attained the compulsory 9-years cut-off), urban/rural residence, employment status, total number of children, age at first union and age difference with partner. It further includes a variable measuring whether the woman's father ever battered her mother, or whether herself was beaten by him after age 15, and a binary indicator for partner's alcohol use (Ismayilova 2015). As some may be considered "bad controls", that is, be themselves outcomes to the treatment (Angrist and Pischke 2008), I first run models without these variables and added them

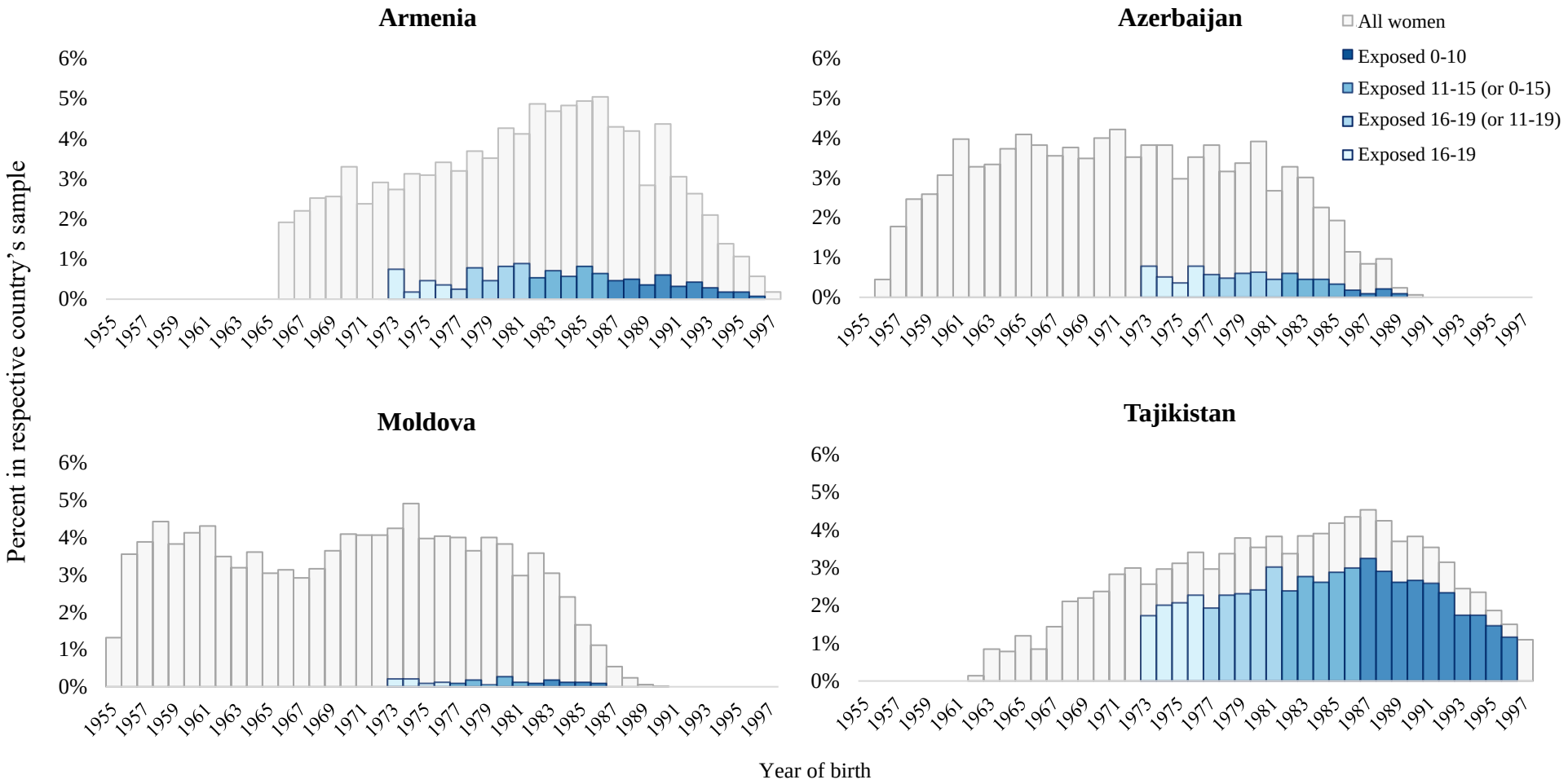
later to improve precision and examine their specific association with IPV. I denote with γ_k, δ_d, φ_{ct} birth-year, district and country-survey fixed effects. Each controls for (time-invariant) unobservable factors at the cohort-, district- and country-level. In specific, γ_k controls for the underlying trend in IPV due to belonging to a younger/older cohort. This might be affected by, for instance, general changes in societal values that may lead younger women to be less tolerant of spousal abuse (Arestoff and Djemai 2016). δ_d accounts for time-invariant local conditions affecting IPV independent of conflict and common to women in the same districts. For Tajikistan, the survey dummies φ_{ct} control for changes in the outcomes that occurred within the country over time.

Next, I delve into when in early-life conflict occurs using the following specification:

$$Y_{ikdt} = \alpha + \beta_1 \text{Conflict0\_10}_{kd} + \beta_2 \text{Conflict11\_15}_{kd} + \beta_3 \text{Conflict16\_19}_{kd} + \theta' X_i + \gamma_k + \delta_d + \varphi_{ct} + \varepsilon_{ikdt} \quad (2)$$

Here, I subdivide the conflict indicator into three separate dummies reflecting the developmental age-periods identified above. Hence, the coefficients attached to each dummy measure the associations between experiencing conflict in a specific life-stage (e.g., between 0-10) and the outcome compared to not being exposed, ever as well as at those particular ages. Some points are worth noting. First, this construction implies that for older (earlier) age-periods, the comparison group includes respondents exposed to war exclusively in earlier (older) periods. Hence, coefficients are on the conservative side. Second, age-periods are not mutually exclusive: a subject could have experienced conflict continuously between ages 0-15 or 11-19 (though not in all three life-stages given the duration of the conflicts). For instance, the age-period variables for childhood and early adolescence are both coded as 1 for a Tajik woman in a conflict-affected district who was 7 when the war started in 1992 because she was aged 12 at its end in 1997. Figure 4.2 allows visualising the cohorts of interest, the proportions of those affected by war (at different ages) in each country sample, and the comparison groups. In specification (1), the comparison group includes all women in the 'grey' bars. In specification (2) the comparison group, e.g., to those exposed to war between ages 0-10 (dark blue), also includes women in 'lighter-blue' bars, except for respondents who due to their age at conflict onset/end fall into both

Figure 4.2 Cohort percentages and conflict-affected women in each cohort, by country



Sources: Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Note: Blue bars indicate women who were exposed to conflict between 0-19. Dark blue bars on the right-hand side indicate women within respective cohorts who were exposed to conflict between ages 0-10 only; lighter blue bars on the left-hand side indicate women who were exposed to conflict between 16-19 only. Women in middle lighter blue bars were exposed to conflict between 11-15 and 16-19, but could have also been consecutively exposed between 0-15 or 11-19.

the 0-10 and 11-15 age-group variables (as in the example of the Tajik woman). I later add interaction terms between the age-period conflict dummies to tackle this aspect and examine if exposure to war earlier in life moderates the association between exposure at older ages and the outcomes.

In the absence of older survey waves to investigate pre-conflict trends in IPV, my approach relies on within-cohort/within-district comparisons, controlling for confounding factors. I am aware that the lack of full migration histories and information on place of birth raises concerns about measurement and selection bias due to endogenous migration. I address this issue and run other tests in the robustness checks. Regressions are weighted for selection in the IPV module following survey weights re-scaling, and robust standard errors are clustered at the district-level (Bertrand et al. 2004).

4.6 Results

4.6.1 Descriptive results

Table 4.1 shows summary statistics for the pooled and country-specific samples of women completing the IPV modules. Overall, about 22% of respondents reported having ever experienced at least one form of IPV and 19% the year before the interview. Rates were lowest in Caucasian countries, and highest in Moldova and Tajikistan (both above 20%). In Tajikistan, rates increased over time. The cross-country similarity in life-time and past-year IPV suggests that most women who ever experienced IPV were (also) victimised the year before the survey. Forms of physical violence were generally the most frequently declared, yet only 2% of respondents in the pooled sample reported sexual abuse. Partner's controlling behaviour was particularly common, with over 71% reporting at least one form of control.

As for conflict, about 34% of respondents experienced armed violence at some point in life, and 26% by age 19. Around 17% were exposed in childhood (0-10), nearly 11% between 11-15 and 9% at ages 16-19. As Figure 4.2 showed, Tajikistan had the highest proportion of women affected by war. Here, the majority experienced conflict in childhood, whereas in Azerbaijan most women were exposed to war in adolescent ages. Exposure to war was lowest in Moldova, where only about 2% experienced conflict in either childhood or adolescence. As per other characteristics, about 19% of women

reported having a violent father and 44% a partner drinking alcohol. On average, women married in their early 20s, mainly reside in rural areas and have at least 9 years of schooling. Most respondents were unemployed and <5 years younger than their partners (Table A4.2).

Looking at the unconditional associations between the main variables of interest, two points seem particularly salient (Table 4.2). First, women exposed to conflict by age 19 generally reported higher rates of domestic abuse (and more lenient attitudes towards IPV) than those not exposed at corresponding ages, or ever. For instance, about 27% of women exposed in early childhood (0-10) or adolescence (11-15) reported having ever experienced IPV (correspondingly, 73% do not) as compared to 21% of those living in more peaceful conditions, ever and at those ages. Differences were evident for physical violence and controlling behaviour, but not for sexual or psychological violence. Second, associations were stronger and differences were wider the younger the age at conflict exposure. The weaker associations between most IPV outcomes and war exposure in adolescence were possibly due to the comparison group, which included women exposed only in childhood. Nevertheless, there seems to be a pattern of young-age conflict exposure linked to greater future victimisation, particularly physical, from partners. The next section examines the relationship with regression models.

4.6.2 Estimation results

Table 4.3 reports the results of fully-adjusted linear models for exposure to conflict by age 19, whereas Table 4.4 presents those of models with age-periods dummies. Estimates show a significant positive association between conflict exposure by age 19 and women's probability of later victimisation from partners (Table 4.3), and that this result was driven by childhood (0-10) exposure to conflict (Table 4.4). Experiencing war before age 11 increased the likelihood of life-time (Col. 1) and past-year (Col. 6) victimisation by 7 and 5 percentage points, respectively. Though these values perhaps appear minor impacts at first, they are equivalent to a nontrivial increase of 32% and 28% relative to the sample means of each outcome (recalling that 21% and 19% of women reported life-time and past-year IPV, respectively). The similar coefficient sizes suggested little fading in the impact of conflict on IPV, or recall bias. The relationship with exposure to war at older ages (11-19)

remained positive, but was generally not significant, except for a moderate link between past-year IPV and conflict in early teens (11-15). As for specific forms of IPV, war by age 19 increased the risk for all types of abuse from partners, and again the results were driven by exposure at the youngest ages. Childhood exposure was strongest linked to physical and sexual abuse (Cols.2-3), and more mildly to psychological violence (Col. 4). I found no evidence of a relationship with partners' controlling behaviours, though coefficients were still positive.

Besides conflict violence in childhood, having a violent father and a partner drinking alcohol increased the probability of all outcomes, particularly physical abuse. In contrast, the relationship with education was negative: *ceteris paribus*, women with 9+ years of education were less likely to experience IPV, but not controlling behaviours. Residence type, employment status and spousal age difference were not associated with IPV, whereas early marriage and having more children increase vulnerability (not shown).

4.6.3 Interactions

As a woman could have experienced conflict both in childhood and early teens (0-15) or continuously during adolescence (11-19), it is important to examine whether war exposure at earlier ages moderates the relationship at older ages. I thus introduced interaction terms between the age-period conflict dummies. Results for life-time IPV are in Table A4.3. Other outcomes are not shown given equivalent findings. In Col. 1, the coefficients of each age-period conflict dummy (β_1-β_3) estimate the main relationship for those exposed only at ages 0-10, 11-15 and 16-19; coefficients β_4 and β_5 show additional changes related to continuous exposure between 0-15, and adolescence (11-19), respectively. In Col. 2, I combined adolescent ages into a single variable (11-19) and interacted it with childhood exposure to capture more succinctly any moderating influence of childhood exposure on adolescent exposure. I found no additional changes in the relationship due to continuous exposure to conflict, confirming that war was associated with IPV exclusively when experienced in very early-life.

Table 4.2 Associations between conflict exposure at different life-stages. IPV outcomes and attitudes

	Conflict exposure between (%)											
	Ages 0-19			Ages 0-10			Ages 11-15			Ages 16-19		
	Exposed	Not exposed	*p*-value	Exposed	Not exposed	*p*-value	Exposed	Not exposed	*p*-value	Exposed	Not exposed	*p*-value
Ever experienced												
Any IPV	26.6	20.2	<0.001	27.5	20.7	<0.001	26.7	21.3	0.002	24.8	21.6	0.273
Physical violence	20.0	13.0	<0.001	20.4	13.6	<0.001	20.5	14.1	<0.001	19.0	14.4	0.001
Sexual violence	2.0	2.4	0.208	2.3	2.3	0.755	1.9	2.4	0.251	1.5	2.4	0.173
Psychological violence	13.0	11.9	0.485	13.2	12.0	0.691	13.6	12.0	0.962	12.6	12.2	0.081
Controlling behaviour	78.9	69.5	<0.001	81.0	70.1	<0.001	77.6	71.3	<0.001	75.3	71.6	0.020
Has experienced past-year IPV	23.1	17.2	<0.001	24.2	17.6	<0.001	22.8	18.2	0.011	20.7	18.5	0.752
Has a violent father	14.2	19.9	<0.001	14.5	19.3	<0.001	14.1	19.0	<0.001	13.5	18.9	<0.001
Justifies wife-beating at least once	66.2	41.7	<0.001	68.5	43.8	<0.001	65.5	45.9	<0.001	62.5	46.7	<0.001

Source: Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: age categories are not mutually exclusive (a respondent could be exposed to conflict in two consecutive life-stages). "Exposed" indicates women who experienced conflict during the specified ages. "Not exposed" refers to women who did not experience conflict ever or in the specified ages, but may have in earlier/later age periods.

Table 4.3 Exposure to conflict by age 19 and women's experiences of IPV

		Ever experienced				
	Ever experienced any violence	**Physical violence**	**Sexual violence**	**Psychological violence**	**Controlling behaviour**	**Past-year IPV**
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure to conflict at age 0-19	0.063***	0.041**	0.011*	0.036**	0.015	0.054***
	(0.015)	(0.013)	(0.006)	(0.012)	(0.016)	(0.014)
District FE	YES	YES	YES	YES	YES	YES
Birth-year FE	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES
Observations	17,787	17,787	17,787	17,787	17,787	17,787
R-squared	0.168	0.145	0.145	0.107	0.181	0.153
F test p-value	0.000	0.000	0.000	0.000	0.001	0.000

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module. Robust standard errors are clustered at the district level. All models control for survey-country dummies, having a violent father, partner's alcohol use, education (9+ years), urban residence, spousal age difference (0 or husband younger, 1-5, 6+), age at marriage, children ever born and employment status. The sample includes all women who were interviewed in the IPV module. In Col. 1, the dependent variable indicates whether the woman ever experienced one or more IPV from her partner. In Cols. 2-5, whether she experienced each specific type of violence or controlling behaviour from her partner. In Col. 6, the dependent variable indicates whether the woman experienced any form of IPV in the 12 months preceding the survey. †p<0.10, *p<0.05, **p<0.01, ***p<0.001.

Table 4.4 Young-age exposure to conflict and women's experiences of IPV

	Ever experienced any violence	Ever experienced				
		Physical violence	Sexual violence	Psychological violence	Controlling behaviour	Past-year IPV
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure to conflict at age 0-10	0.070***	0.039*	0.019**	0.031*	0.011	0.052**
	(0.019)	(0.018)	(0.007)	(0.015)	(0.020)	(0.019)
Exposure to conflict at age 11-15	0.030	0.032†	-0.003	0.027†	0.006	0.036*
	(0.019)	(0.018)	(0.006)	(0.015)	(0.020)	(0.018)
Exposure to conflict at age 16-19	0.017	0.006	0.003	0.013	0.024	0.014
	(0.021)	(0.019)	(0.007)	(0.017)	(0.022)	(0.020)
Has a violent father						
Yes	0.180***	0.123***	0.030***	0.108***	0.066***	0.170***
	(0.011)	(0.010)	(0.005)	(0.010)	(0.010)	(0.011)
Partner's alcohol abuse						
Yes	0.126***	0.101***	0.014***	0.068***	0.091***	0.113***
	(0.009)	(0.008)	(0.003)	(0.007)	(0.009)	(0.008)
Education						
>9 years	-0.038***	-0.020***	-0.007*	-0.025***	-0.013	-0.033***
	(0.008)	(0.007)	(0.003)	(0.007)	(0.009)	(0.008)
District FE	YES	YES	YES	YES	YES	YES
Birth-year FE	YES	YES	YES	YES	YES	YES
Observations	17,787	17,787	17,787	17,787	17,787	17,787
R-squared	0.169	0.145	0.146	0.107	0.182	0.153
F test p-value	0.000	0.000	0.000	0.000	0.000	0.000

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module. Robust standard errors are clustered at the district level. All models control for survey-country dummies. Beyond the shown covariates, other controls include urban residence, spousal age difference (0 or husband younger, 1-5, 6+), age at marriage, children ever born and employment status. The sample includes all women who were interviewed in the IPV module. In Col. 1, the dependent variable indicates whether the woman ever experienced one or more IPV from her partner. In Cols. 2-5, whether she experienced each specific type of violence or controlling behaviour from her partner. In Col. 6, the dependent variable indicates whether the woman experienced any form of IPV in the 12 months preceding the survey. †p<0.10, *p<0.05, **p<0.01, ***p<0.001.

4.6.4 Alternative specifications and robustness checks

Results were robust to various checks. First, there was the concern of potential selection bias due to endogenous migration. If more vulnerable women were more likely to move out of conflict areas, and vulnerability correlated with greater chances of experiencing IPV, then estimates would have been dragged against finding significant results. Alternatively, coefficients may be biased towards significance if poor social networks prevent some women to migrate from conflict zones, and weak ties are associated with a higher risk of IPV (La Mattina and Shemyakina 2020). To examine this issue, I limited the analytical sample to women who did not migrate since the start of each conflict (*N*=9,447), using questions on years lived in the current location (see Table A4.4 for differences in observable characteristics between migrants and non-migrants). For Azerbaijan, I employ this information to specifically identify non-IDP/refugee women never moving from Karabakh territories. This check is also important given the time-lag and migratory moves between conflict and survey data collection which, for instance, were considerable in Tajikistan (note that respondents from Tajikistan 2012 DHS are excluded from these analyses as not asked about years lived in current residence) (O'Brein 2021). The direction and significance of the relationships remained generally stable (Table A4.5): conflict exposure in childhood was positively associated with IPV and the increase is comparable to that observed in the full sample (the coefficient of 0.09 in Col. 1 represents a 38% increase in the likelihood of IPV for never-migrant women exposed to conflict in childhood relative to the sample mean). Exposure at any other age, and in multiple periods (not shown) was not associated with later-life IPV.

Second, I restricted the sample to women who married/cohabited after 1991 (*N*=12,887), i.e., after the onset of each conflict, to make the exposed and non-exposed groups as comparable as possible at the detriment of the sample size. Again, the only significant relationship was with childhood conflict exposure (Table A4.6). Its strength and size were though weaker, suggesting more homogenous outcomes for women who formed unions after the Soviet breakup.

Third, I run models with the full and the non-migrant samples, excluding or including only Azerbaijan as I there defined conflict exposure using a combination of information on IDP/refugee status and

residence in conflict-affected districts, not geospatial measures. In both cases, results remained qualitatively equivalent, although in the Azerbaijan-only sample (*N*=3,186) the association was weak (Cols.1-4, Table A4.7). Equally, findings for life-time and past-year IPV are stable when I run country-specific models for the remaining countries (Cols.5-10, Table A4.7), and when I excluded (*N*=9,683) cases from Tajikistan, the country which provided most cases and where respondents were more likely to have experienced war and IPV (not shown). Country-specific models yielded similar results also for the non-migrant samples.

Fourth, I estimated models using different age cut-offs for conflict exposure. Given the relevance of early childhood, I first split the youngest age-group category into 0-5 and 6-10 (there were too few cases of exposed women at very early ages (0-2, 3-5) in Moldova (none) and Azerbaijan (*n*=13) to subdivide this age-group into smaller categories). Although further disaggregation of this kind may lead to less precise estimates, it can inform us on whether, for instance, conflict had different impacts on girls who were of pre-school versus schooling ages, and hence suggest driving routes. Then, I did the opposite and collapse the age groups into non-teen (0-12) and teen-ages (13-19). Results broadly mirrored those of the main models (Tables A.8). Conflict in pre-school (ages 0-5), early school-age (6-10) or before age 13 was positively associated with greater IPV. Sexual abuse was here strongly, yet only, linked with exposure in infancy (ages 0-5) (not shown).

Fifth, I performed analyses using progressively increasing (20km) and decreasing (10km) buffer radii for the countries providing geospatial survey data. I did this first because, in the absence of theoretical or empirical priors, I chose the 15km conflict "catchment" areas for practical reasons related to the small size of the selected countries and comparability with Azerbaijan; second, because DHS randomly displace cluster coordinates by up to 5km to ensure respondents' privacy. Results were comparable to the main specification using a 15km buffer (Figure A4.3, Panel A). For the full sample, the coefficient size for childhood exposure increases with the buffer radius. Conversely, in the non-migrant sample, the magnitude of the association decreased with distance (Figure A4.3, Panel B). This perhaps suggests particular vulnerability to IPV for women living close to conflict events when young and who never relocated since. Relatedly, to further check the importance of conflict

measurement level (and thus close proximity to violence), I run analyses using the broad DHS sub-national regions as proxies for exposure to conflict, as prior work has done (La Mattina and Shemyakina 2017). Living in a more unstable region at young ages was not associated with greater victimisation in adult life, either in the pooled sample or in each specific country (Table A4.9). The finding that a relationship was only visible with indicators that more carefully considered women's proximal exposure to conflict, whilst it disappeared with region-level measures, is revealing of the importance of measuring conflict with fine-grained indicators.

Finally, I checked the robustness of the results to model specification, including logit and probit regressions, augmented linear models with a country-specific or district-specific linear birth cohort trend to further account for unobservable country/district and birth-year specific common trends (La Mattina and Shemyakina 2020), and run models using cluster rather than district fixed effects (Adhvaryu and Fenske 2014). In all cases, estimates remained very similar to the main results.

4.7 Potential mechanisms

4.7.1 Family violence

Findings indicated a higher risk of abusive relationships in adulthood for women exposed to war in childhood. A potential channel may be increased exposure to family violence. Prior research documenting rising IPV during armed conflicts and well-established knowledge that childhood experiences of family violence are highly predictive of later victimisation give reason to expect these women to have experienced greater levels of violence within the family, resulting in a later greater higher risk of victimisation in their own relationships.

I examined this mechanism using information on father's violent behaviour against the respondent or her mother. Admittedly, the wording of the survey questions is not ideal as it only captures 'ever' witnessing the father beating the mother or having 'ever' been directly abused since age 15, and hence does not allow a detailed examination of the timing of the onset of the father's violence. Results in Col. 1, Table 4.5 confirmed the hypothesis: women who experienced conflict in childhood only were more likely to have a violent father. Country-specific estimates further suggested a significant

association in Tajikistan (β=0.059; 95% CI: 0.019–0.098), and a positive sign in Armenia and Azerbaijan. These findings perhaps suggest that war translated into greater aggressive behaviour of male figures within the family, especially in the bloodiest and geographically-spread conflict (Tajik civil war), and that this childhood history of family abuse in turn had harmful implications for women's later risk of IPV.

4.7.2 Attitudes towards IPV

Another plausible reason may be that war in early-life affects perceptions of acceptable social behaviour to the extent that it legitimises force within private relationships. If violence becomes a norm, conflict-affected girls may become more vulnerable to IPV because of increased emotional callousness to abuse. It is also plausible to expect a normalisation in the use of violence in future interpersonal relations in men, and thus potential perpetrators, exposed to conflict when young. I next assessed the 'desensitisation-normalisation' hypothesis in women and men as a potential channel.

Apart from actual experiences of spousal abuse, DHS collect information on attitudes towards IPV in several situations (e.g., if the woman neglects children, burns the food, or refuses sex. Table A4.1 for specific questions) from all female respondents and one randomly selected man (aged 15-49/59) in a sub-sample of households. I used this information to generate two new dependent variables, one for whether the respondent agrees with at least one statement on wife-beating, the other that counts the total number of instances in which the respondent justifies violent partner behaviour, and estimated models for each gender. As for women, I built conflict variables for men using geocoded measures or IDP/refugee information. Unfortunately, Tajikistan's DHS did not collect information from men. Hence, estimates for men come from the other three countries only.

Results for women showed no link between war exposure and the number of episodes in which women tolerate wife-beating (Cols. 2-3, Table 4.5). The same was for justifications of wife-beating in at least one situation, even when models for count data were specified (not shown). Models with interaction terms, performed separately for each country and on the non-migrant sample also yielded similar estimates (not shown).

Table 4.5 Young-age exposure to conflict, family violence and attitudes towards IPV

	Women			Men	
	Having a violent father	**N. of situations in which wife-beating is justified**	**Wife-beating justified in at least one situation**	**N. of situations in which wife-beating is justified**	**Wife-beating justified in at least one situation**
	(1)	(2)	(3)	(4)	(5)
Exposure to conflict at age 0-10	0.036*	0.081	-0.005	-0.184	-0.076
	(0.17)	(0.084)	(0.021)	(0.137)	(0.055)
Exposure to conflict at age 11-15	0.004	-0.007	0.020	0.041	-0.037
	(0.017)	(0.078)	(0.020)	(0.168)	(0.055)
Exposure to conflict at age 16-19	0.003	0.036	-0.023	0.331*	0.169**
	(0.018)	(0.089)	(0.023)	(0.163)	(0.054)
District FE	YES	YES	YES	YES	YES
Birth year FE	YES	YES	YES	YES	YES
Observations	17,787	17,787	17,787	8,350	8,350
R-squared	0.239	0.369	0.335	0.307	0.279
F test p-value	0.000	0.000	0.000	0.000	0.000

Source: Women and men (excluding Tajikistan for the male sample) recodes of the DHS. Notes: The results are estim using OLS. Regressions for women are weighted using survey weights for selection into the IPV module. Robust stan errors are clustered at the district level. All models control for survey-country dummies. In Col.1 controls include u residence, educational level, partner's alcohol abuse, employment status, spousal age difference, age at marriage and chil ever born. Cols. 2-3, also include a control for having a violent father. In Cols. 1-3, the sample includes all women intervie in the IPV module. In Cols. 4-5, the sample includes all men interviewed in the men questionnaire. In Col.1 the depen variable is a binary indicator taking the value of one if the woman's father ever battered her mother, or whether she was be by him after age 15. In Cols. 2 and 4, it counts the number of situations in which wife-beating is justified (0-5). In Cols. 3 5, it is coded one if wife-beating is justified in at least one situation. †p<0.10, *p<0.05, **p<0.01, ***p<0.001.

To further explore the 'desensitisation' side of the hypothesis, I examined the probability of separation/divorce in women who reported experiencing IPV. The rationale is that, if war desensitises women to violence within unions, then those exposed to conflict should be less likely to leave abusive relationships (Gallegos and Gutierrez 2016; Svallfors 2021b). I found no differences in the likelihood of union dissolution for women exposed to war in childhood in this sub-sample (not shown), which further discards desensitisation as a plausible channel.

Patterns in attitudes towards IPV are more complex for men (Table 4.5, Cols. 4-5). Exposure to conflict as a young boy was not associated with either indicator of acceptance of wife-beating. Conversely, war in late adolescence (16-19) significantly increased the number of episodes in which men deem IPV acceptable and the probability of justifying it in at least one situation. The result was confirmed when including an interaction between the age-period conflict dummies, and was stable in terms of direction at the country-level (Armenia: $\beta_{\text{conflict exposure between 16-19}}$=0.26; 95% CI: 0.12–0.39; Azerbaijan: β=0.15; 95% CI: 0.01–0.17; Moldova: β=0.17; 95% CI: -0.01–0.51). The size of the impact is considerable: conflict exposure in late teens increased the chance of responding affirmatively to at least one question on wife-beating by 0.169, i.e., by 48% relative to the sample mean. This could signal that war carries 'normalising' lasting consequences on men's formation of attitudes towards IPV, especially for adolescent boys. That is, for those young ones who, because of their age at wartime, are more susceptible to direct engagement in armed violence (Lowicki 2000). The fact that the result was visible with different magnitude, but with the same direction both in the pooled and country-specific models is further revealing of the plausibility of this channel, at least in countries characterised by officially unsettled conflicts.

4.7.2 Other plausible mechanisms

Several other channels may explain women's higher probability of experiencing abusive relationships after conflict exposure in early childhood. Conflict-induced changes in education, marriage timing and spousal age difference are the few I could test with present data. These pathways give cues on war-related changes in marriage market conditions that may be linked to IPV. I thus run models using (i) years of education attained by women and (ii) by their partners, (iii) female age at marriage and (iv) spousal age difference as dependent variables. I further looked at women's employment status in the survey year to test if conflict exposure was somehow related to their income-generating activities.

For all outcomes, I found no significant differences associated with women's exposure to conflict by age 19. I only found small reductions in educational attainment (3.5 months, p=0.017). There was also no link between exposure to conflict by age 19 and men's educational attainment. Ergo, none of these channels added explanations to the higher IPV risk of women early-exposed to war (or to the greater toleration of men affected by conflict when adolescents).

4.8 Limitations

There are some limitations warranting mention. Although I endeavoured to exploit the depth and breadth of available information on both forms of violence, data are cross-sectional and do not allow exploring pre-conflict trends in IPV. Causal interpretation rests on the assumption that trends in IPV across cohorts would have been the same in conflict-affected and non-affected areas, had the war not occurred. To the degree that this assumption is violated, my estimates represent correlations. The occurrence of war amid a politico-economic transition represents an additional challenge in this respect. However, by leveraging on the uneven geographical distribution of the conflicts, I showed that IPV for young conflict-affected cohorts was higher than for older women and, importantly, than for their peers who "only" experienced the transition to a market economy.

Results should be interpreted with caution and as lower-bound estimates given potential reporting bias. Despite DHS rigorous data collection procedures, conflict may have exacerbated barriers to IPV disclosure and social desirability bias that are widespread even in peaceful contexts, or created additional obstacles to honest reporting, e.g., via rule-of-law deficits and cultures of impunity (Palermo et al. 2014; Okello and Hovil 2007). Estimates come from samples of survivors to war and IPV. It is not possible to know if IPV correlated with one's survival chances, and to account for those who emigrated from each country, whether due to conflict/spousal violence or not.

Due to lack of data, I cannot explicitly analyse the frequency of IPV victimisation. In addition, one of the reasons for data pooling was to minimise the estimation issues associated with a small sample size. These risks are automatically re-introduced when one tries to disentangle narrower relationships with specific forms of IPV (with smaller ages at exposure as shown in sensitivity analyses, or at the

country-level). This limitation highlights another reason why the relationship between multiple forms of violence over time is poorly documented at the micro-level.

Data constraints precluded additional analyses that could shed more light on driving mechanisms, such as stress/trauma, patterns in alcohol consumption, parental characteristics, especially in relation to poverty, and timing of exposure to familial violence. Exploring these pathways alone and their interactions represents a crucial avenue for future research as any single channel is unlikely to be fully explanatory. Relatedly, given the smaller sample (men's questionnaires were administered to a sub-sample of households, and not collected in Tajikistan), I choose to examine men's views of IPV including all male respondents, not only women's current partners. Interest in uncovering conflict-related changes in normative values affecting the whole group of potential perpetrators, not just partnered men, further justified this choice. Linking men's exposure to conflict to women's actual reporting of domestic abuse, e.g., via matching techniques, represents another promising research avenue. Similar advances though must be preceded by wider investments in data collection at the couple-level.

Finally, as in many studies employing DHS and its GIS data, a lack of information on respondents' place of birth and the displacement of survey cluster locations may affect the accuracy of measures based on georeferencing (Skiles et al. 2013). Nonetheless, the spatial measurements used in this study are more fine-grained and precise in terms of geographical units than the large regional variation employed in prior cross-national research (La Mattina and Shemyakina 2017). Results were also robust to the use of different "catchment" areas, together increasing confidence in the findings and highlighting the importance of building careful and granular conflict measures. Conflict measures based on IDP/refugee status may as well be influenced by reporting issues and not fully comparable to geocoded ones. However, as a direct indicator of conflict exposure seldom available in surveys, IDP/refugee status represented the best alternative to missing GIS data. Related concerns are reduced as the main results did not change when I only included/excluded Azerbaijan in the analyses.

4.9 Discussion and conclusion

The end of a conflict not always brings an end to violence. In war zones, violence can morph into less visible forms, and intrude into the private realm of the family. Its scars can also persist over the life-course. This paper examined the long-term implications of young-age exposure to conflict on women's later domestic victimisation in post-Soviet Eurasia, where IPV is perceived as a serious concern, but legislative instruments to protect victims are weak (Gallup World Poll 2015).

The results showed a greater probability of IPV for women who experienced armed conflict in childhood. Exposure in adolescence was too positively linked to partner abuse, yet the association was generally not significant nor was exposure across multiple periods. Findings were not driven by migration, and were similar at the country-level. Conflict in childhood was strongly associated with physical forms of IPV, and with future sexual abuse when experienced in infancy. Although this latter result should be taken with care due to small numbers, the overall message seems to be that the earliest the conflict experience, the more scarring and physically damaging the possible consequences.

These findings agree with previous research documenting increasing levels of IPV in contexts affected by armed conflict (e.g., Østby 2016), thereby extending the pool of evidence on the transmissibility of violence across social spaces. Importantly, they align with the two prior studies that further considered the age at war exposure, though my estimates tend to be larger in size (Gallegos and Gutierrez 2016; La Mattina and Shemyakina 2017). A reason for this may be that the conflicts examined here took place amid a major socio-political transformation that challenged the economic stability, national identities, gender and social values of these populations in ways that were already detrimental to women (UNICEF 1999), and that wars further exacerbated. Although the final result is thus to be understood as a combination of experiencing conflict as well as the transition to a new socio-political regime, the consistency of findings with prior studies (therefore across sites and conflicts) increases confidence in the direction of relationship and calls for greater attention to be paid to armed violence when studying the determinants of IPV.

If domestic abuse in war settings is not isolated from the experience of conflict itself, what processes may promote this continuation of violence? My empirical investigation of some of the many theoretically plausible avenues suggested that neither conflict-related changes in marriage market conditions, nor in women's attitudes towards IPV explain the link. What happens to men during war, instead, appeared salient. First, the finding that women experiencing conflict in childhood were more likely than any other group to have a violent father – especially in Tajikistan where the war was highly intense and accompanied by a rapid return to traditional family values and gender roles (Falkingham 2000) – corroborates the idea that armed conflict has 'immediate' implications for the behaviour of men in the domestic realm. Importantly, it also suggests that this may have lasting intergenerational effects on daughters. Second, the finding that men exposed to war in late adolescence were more inclined to justify IPV perhaps indicates that, beyond simultaneous consequences on violent behaviour, war may carry enduring implications for men's attitudes towards violence. Given that gender attitudes are good predictors of gender behaviour (Ajzen and Fishbein 1973), it is possible that men who experienced conflict at ages when they would be more likely to be mobilised and fight modelled their later-life beliefs and value system (and, presumably, behaviours) on what they learned in the battlefield (Mendelsohn and Straker 1998). It is worth noting that this channel was visible in all three countries where conflicts remain unsettled. More data collection efforts should be made to investigate this aspect also where a peace agreement has been reached, as in Tajikistan.

The findings on attitudes towards IPV draw attention to another gender-related difference in the legacy of war that has not yet been thoroughly examined. While the gendered consequences of war on health and survival (Ghobarah et al. 2003; Plümper and Neumayer 2006), education and labour market outcomes (Bertoni et al. 2019; Justino 2017) are vastly documented, only recently interest has been directed to attitude formation, especially concerning interpersonal violence (La Mattina and Shemyakina 2020). Results further emphasise the importance of considering the role of caregivers, and the interconnection between gender and age (i.e., when exposure occurred) when analysing the consequences of such shocks.

Addressing the transmission of violent behaviour through the lenses of attitude formation, and with a focus on the age at conflict exposure matters for the development of programs that can respond to specific patterns and drivers of violence. My findings suggest that women-targeting policies should give close attention to early childhood experiences of violence both inside and outside the family domain, and ensure safe environments for girls and their caregivers. At the same time, interventions tackling IPV could devote ad-hoc resources to the cohorts of boys exposed to conflict violence, and to their "incubation" period. This could be achieved through a mix of initiatives focused on trauma-healing, de-escalation and promoting non-violent models of masculinity (Fulu et al. 2013). Tailored interventions of this kind, if promptly implemented, would not only help break the cycle at the individual-level, but also prevent intergenerational ripple effects otherwise difficult to dismantle (Kelly et al. 2018).

Besides tangible destruction, wars generate a lasting amount of confrontation with violence of all kinds. Violence within the home may be part of the troubling social relations armed conflicts create and needs to be considered as one of its possible consequences if we want to achieve a complete understanding of the legacy of war and devise comprehensive approaches to support the long-term path to recovery.

4.10 Appendix A

Table A4.1 DHS Questions on experiences and attitudes towards IPV

Types of IPV	DHS Questions
Psychological violence	(1) Ever (or in the past 12 months) been humiliated by partner (2) Ever (or in the past 12 months) been threatened by partner (3) Ever (or in the past 12 months) been insulted or made feel bad by partner
Physical violence	(1) Ever (or in the past 12 months) been pushed, shook or had something thrown by partner (2) Ever (or in the past 12 months) been slapped by partner (3) Ever (or in the past 12 months) been punched or hit by something harmful by partner (4) Ever (or in the past 12 months) been kicked or dragged by partner (5) Ever (or in the past 12 months) been strangled or burnt by partner (6) Ever (or in the past 12 months) been threatened with a weapon by partner (7) Ever (or in the past 12 months) had bruises because of partner (8) Ever (or in the past 12 months) had eye injuries, sprains, dislocations or burns because of partner (9) Ever (or in the past 12 months) had wounds, broken bones, teeth or other serious injuries because of partner
Sexual violence	(1) Ever (or in the past 12 months) been physically forced into unwanted sexual intercourse by partner (2) Ever (or in the past 12 months) been physically forced into other unwanted sexual acts by partner
Controlling issues	(1) Partner is jealous if respondent talks to other men (2) Partner accuses respondent of unfaithfulness (3) Partner tries to limit respondent's contact with family (4) Partner does not allow meeting female friends (5) Partner insists on knowing where respondent is
Attitudes towards IPV	Wife beating is justified *if she*… (1) Goes out without telling husband (2) Neglects the children (3) Burns the food (4) Argues with husband (5) Refuses to have sex with husband

Source: Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS.

Table A4.2 Additional descriptive statistics for pooled sample

	Percent OR Mean	***N***
Age at interview (years, mean)	33.7	17,787
Age at first marriage (years, mean)	20.25	17,787
Children ever born (mean)	2.44	17,787
Urban	37.91%	6,744
9+ years of education	57.13%	10,162
Employed	33.60%	5,977
Has a violent father	18.48%	3,287
Partner drinks	43.78%	7,787
Spousal age difference		
No difference or younger husband	7.12%	1,266
1-5	67.00%	11,917
6-9	21.24%	3,777
10+	4.65%	827
Total		17,787

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: The sample includes women interviewed in the IPV module. Observations are weighted using provided sampling weights for selection into the IPV modules.

Table A4.3 Young-age exposure to conflict and women's experiences of IPV - interactions

	Ever experienced IPV	
	(1)	(2)
Exposure to conflict at age 0-10 (β_1)	0.078*** (0.021)	
Exposure to conflict at age 11-15 (β_2)	0.087 (0.094)	
Exposure to conflict at age 16-19 (β_3)	0.005 (0.024)	
Exposure to conflict at		
0-10 * 11-15 (β_4)	-0.076 (0.098)	
11-15 * 16-19 (β_5)	-0.035 (0.097)	
Exposure to conflict at age 0-10 (β_6)		0.078*** (0.021)
Exposure to conflict in adolescence (11-19) (β_7)		0.035 (0.018)
Exposure to conflict at		
0-10 * 11-19 (β_8)		-0.023 (0.031)
District FE	YES	YES
Birth year FE	YES	YES
Observations	17,787	17,787
R-squared	0.169	0.169
Test $\beta_1 + \beta_4 = 0$ (*p*-value)	0.983	
Test $\beta_2 + \beta_4 = 0$ (*p*-value)	0.660	
Test $\beta_1 = \beta_2$ (*p*-value)	0.922	
Test $\beta_2 + \beta_5 = 0$ (*p*-value)	0.056	
Test $\beta_3 + \beta_5 = 0$ (*p*-value)	0.753	
Test $\beta_2 = \beta_3$ (*p*-value)	0.392	
Test $\beta_6 + \beta_8 = 0$ (*p*-value)		0.022
Test $\beta_7 + \beta_8 = 0$ (*p*-value)		0.657
Test $\beta_6 = \beta_7$ (*p*-value)		0.053

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module Robust standard errors are clustered at the district level. All models control for survey-country dummies, having a violen father, partner drinking alcohol, urban residence, education (more or less than 9 years), spousal age difference (0 o husband younger, 1-5, 6+), age at marriage, children ever born and employment status. The sample includes all wome who were interviewed in the IPV module. Column 1 shows the relationship using three conflict-age dummies (0-10, 11 15 and 16-19) and their interactions; Column 2 merges teen ages (0-10, 11-19). †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table A4.4 Balancing test migrant and non-migrant women

	Percent OR Mean		
	Non migrants (*N*=9,447)	**Migrants (*N*=4,694)**	***p*-value**
Ever experienced IPV	21.89%	18.17%	<0.001
Past-year IPV	18.78%	15.59%	<0.001
Conflict exposure (0-19)	24.99%	19.69%	<0.001
Has a violent father	18.93%	21.38%	0.001
Partner drinks	50.04%	50.95%	0.311
Wife beating justified in at least one situation	40.69%	43.91%	<0.001
Urban	50.38%	46.87%	<0.001
9+ years of education	58.52%	52.04%	<0.001
Age at first marriage (years, mean)	20.43	20.72	<0.001
Children ever born (mean)	2.27	2.23	0.060

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2017) DHS. Notes: The sample includes women interviewed in the IPV module. Non migrants are defined as women who never migrated from their location since the start of each conflict (for the Azerbaijani sample this includes IDPs/refugee and women who never migrated from Karabakh territories since 1991).

Table A4.5 Young-age exposure to conflict and non-migrant women's experiences of IPV

	Ever experienced IPV	Past-year IPV	Ever experienced			
			Physical violence	Sexual violence	Psychological violence	Controlling behaviour
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure to conflict at age 0-10	0.087***	0.067**	0.076**	0.004	0.022	0.010
	(0.026)	(0.025)	(0.025)	(0.07)	(0.022)	(0.027)
Exposure to conflict at age 11-15	0.006	0.018	0.002	-0.001	0.033	-0.001
	(0.025)	(0.024)	(0.023)	(0.006)	(0.022)	(0.022)
Exposure to conflict at age 16-19	0.033	0.043	0.027	-0.01	0.025	0.020
	(0.028)	(0.028)	(0.025)	(0.009)	(0.025)	(0.025)
Has a violent father						
Yes	0.189***	0.174***	0.144***	0.023***	0.104***	0.074***
	(0.015)	(0.015)	(0.014)	(0.006)	(0.014)	(0.014)
Partner drinks						
Yes	0.115***	0.101***	0.091***	0.012***	0.063***	0.094***
	(0.011)	(0.010)	(0.014)	(0.003)	(0.009)	(0.013)
Education						
>9 years	-0.036***	-0.030**	-0.019*	-0.001*	-0.020*	-0.006
	(0.011)	(0.010)	(0.009)	(0.004)	(0.009)	(0.011)
District FE	YES	YES	YES	YES	YES	YES
Birth year FE	YES	YES	YES	YES	YES	YES
Observations	9,447	9,447	9,447	9,447	9,447	9,447
R-squared	0.236	0.230	0.234	0.155	0.133	0.223
F test p-value	0.000	0.000	0.000	0.000	0.000	0.000

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2017) DHS. Notes: The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module. Robust standard errors are clustered at the district level. All models control for survey-country dummies. All models control for survey-country dummies. Beyond the shown covariates, other controls include urban residence, spousal age difference (0 or husband younger, 1-5, 6+), age at marriage, children ever born and employment status. The sample includes all women who were interviewed in the IPV module and who never migrated from their location since the start of each conflict (for the Azerbaijani sample this includes IDPs/refugee and women who never migrated from Karabakh territories since 1991). The dependent variable in Col.1 is whether the woman ever experienced one or more forms of IPV from her partner, in Col.2 if she experienced it the year prior to the survey, in Col.3-6 whether the woman ever experienced specific forms of IPV or controlling behaviour. †p<0.10, *p<0.05, **p<0.01, ***p<0.001.

Table A4.6 Young-age exposure to conflict and women's experiences of IPV (sample married after 1991)

	Ever experienced IPV	Past-year IPV	Ever experienced			
			Physical violence	Sexual violence	Psychological violence	Controlling behaviour
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure to conflict at age 0-10	0.053*	0.040†	0.032†	0.010	0.022	0.007
	(0.022)	(0.021)	(0.020)	(0.007)	(0.0164)	(0.022)
Exposure to conflict at age 11-15	0.024	0.029	0.026	-0.002	0.022	-0.001
	(0.019)	(0.018)	(0.017)	(0.006)	(0.0156)	(0.020)
Exposure to conflict at age 16-19	-0.004	-0.003	-0.005	-0.003	-0.004	0.017
	(0.024)	(0.023)	(0.022)	(0.007)	(0.019)	(0.025)
Has a violent father						
Yes	0.192***	0.182***	0.134***	0.029***	0.107***	0.067***
	(0.014)	(0.014)	(0.013)	(0.007)	(0.013)	(0.012)
Partner drinks						
Yes	0.122***	0.111***	0.101***	0.012***	0.058***	0.074***
	(0.010)	(0.010)	(0.009)	(0.004)	(0.009)	(0.011)
Education						
>9 years	-0.032**	-0.024**	-0.017*	-0.006	-0.024**	-0.017
	(0.010)	(0.009)	(0.008)	(0.003)	(0.008)	(0.010)
District FE	YES	YES	YES	YES	YES	YES
Birth year FE	YES	YES	YES	YES	YES	YES
Observations	12,877	12,877	12,877	12,877	12,877	12,877
R-squared	0.182	0.168	0.170	0.145	0.104	0.123
F test p-value	0.000	0.000	0.000	0.000	0.000	0.000

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS.

Notes: The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module. Robust standard errors are clustered at the district level. All models control for survey-country dummies. Beyond the shown covariates, other controls include urban residence, spousal age difference (0 or husband younger, 1-5, 6+), age at marriage, children ever born, employment status. The sample includes all women who were interviewed in the IPV module and who had their first union/cohabitation after 1991.The dependent variable in Col.1 is whether the woman ever experienced one or more forms of IPV from her partner, in Col.2 if she experienced one or more forms of IPV the year prior to the survey, in Col.3-6 whether the woman ever experienced specific forms of IPV or controlling behaviour. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table A4.7 Young-age exposure to conflict and women's experiences of IPV, excluding Azerbaijan and country-specific samples only

	Excluding Azerbaijan		Azerbaijan		Armenia		Moldova		Tajikistan	
	Ever experienced IPV	Past-year IPV	Ever experienced IPV	Past-year IPV	Ever experienced IPV	Past-year IPV	Ever experienced IPV	Past-year IPV	Ever experienced IPV	Past-year IPV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Exposure to conflict at age 0-10	0.074***	0.055**	0.090†	0.105†	0.049*	0.023†	0.062†	0.054	0.063*	0.040
	(0.020)	(0.020)	(0.078)	(0.077)	(0.020)	(0.018)	(0.075)	(0.096)	(0.026)	(0.025)
Exposure to conflict at age 11-15	0.036†	0.040*	-0.018	-0.015	0.005	-0.001	0.148	0.161†	-0.003	0.008
	(0.020)	(0.019)	(0.059)	(0.058)	(0.020)	(0.015)	(0.095)	(0.097)	(0.031)	(0.029)
Exposure to conflict at age 16-19	0.028	0.023	-0.049	-0.031	-0.014	-0.020	-0.098	-0.092	0.050	0.031
	(0.022)	(0.022)	(0.056)	(0.055)	(0.028)	(0.021)	(0.103)	(0.104)	(0.033)	(0.031)
District FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Birth year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	14,601	14,601	3,186	3,186	2,724	2,724	3,773	3,773	8,104	8,104
R-squared	0.167	0.155	0.128	0.116	0.164	0.155	0.140	0.134	0.266	0.245
F test p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module. Robust standard errors are clustered at the district level. All models control for survey-country dummies. Beyond the shown covariates, other controls include having a violent father, partner drinking alcohol, urban residence, education (more or less than 9 years), spousal age difference (0 or husband younger, 1-5, 6+), age at marriage, children ever born and employment status. In Col.1-2, the sample includes all women who were interviewed in the IPV module in Armenia, Moldova and Tajikistan only. In Col.3-10, the sample is country-specific samples. In odd numbered Cols. the dependent variable captures whether the woman ever experienced IPV. In even numbered Cols. if she experienced it the year prior to the survey. †p<0.10, *p<0.05, **p<0.01, ***p<0.001.

Table A4.8 Young-age exposure to conflict and women's experiences of IPV with different age exposure groupings

	Ever experienced IPV (1)	**Past-year IPV** (2)	**Ever experienced IPV** (3)	**Past-year IPV** (4)
Pre-schooling and schooling age exposure				
Exposure to conflict at age 0-5	0.087***	0.067**		
	(0.025)	(0.024)		
Exposure to conflict at age 6-10	0.087***	0.083***		
	(0.022)	(0.022)		
Exposure to conflict at age 11-15	-0.016	-0.020		
	(0.024)	(0.023)		
Exposure to conflict at age 16-19	-0.018	-0.016		
	(0.021)	(0.020)		
Non-teen and teen age exposure				
Exposure to conflict at age 0-12			0.068***	0.051***
			(0.016)	(0.015)
Exposure to conflict at age 13-19			0.012	0.008
			(0.015)	(0.010)
District FE	YES	YES	YES	YES
Birth year FE	YES	YES	YES	YES
Observations	17,787	17,787	17,787	17,787
R-squared	0.169	0.153	0.168	0.153
F test p-value	0.000	0.000	0.000	0.000

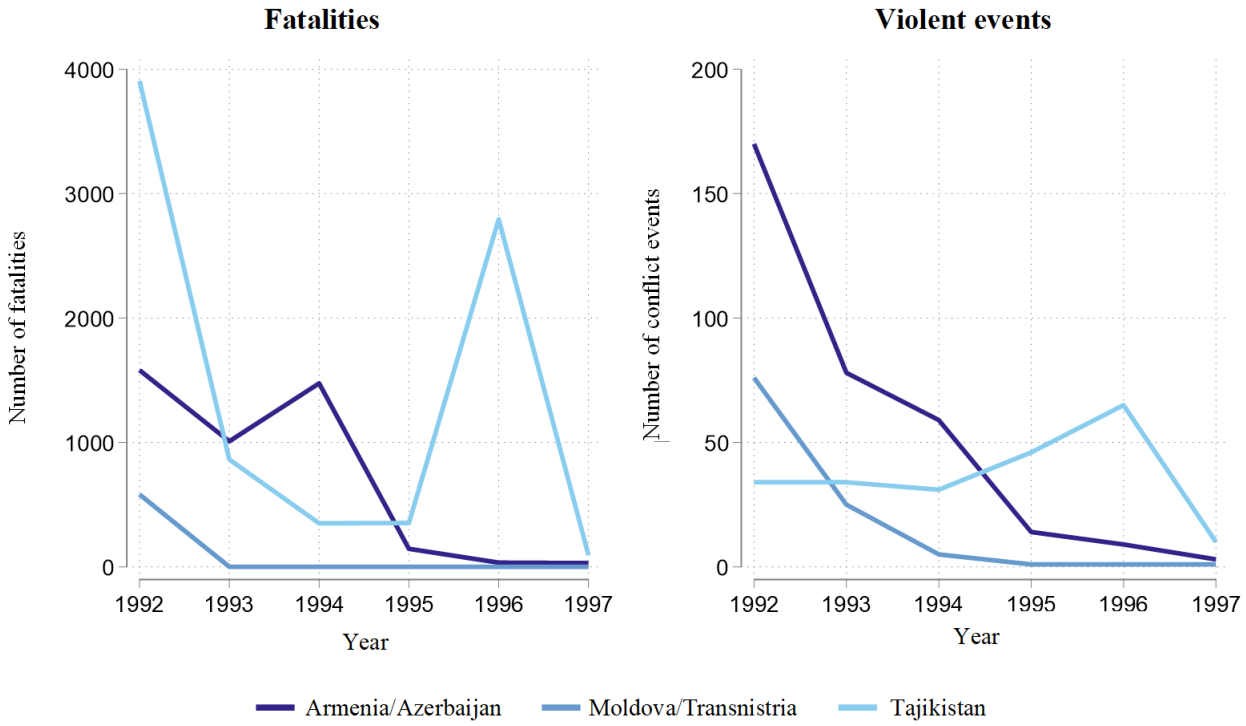
Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module. Robust standard errors are clustered at the district level. All models control for survey-country dummies, having a violent father, partner's alcohol use, education (9+ years), urban residence, education (more or less than 9 years), spousal age difference (0 or husband younger, 1-5, 6+), age at marriage, children ever born, employment status. The sample includes all women who were interviewed in the IPV module. The dependent variable in Cols.1 and 3 is whether the woman ever experienced one or more forms of IPV from her partner, in Col.2 and 4 if she experienced it the year prior to the survey, in †p<0.10, *p<0.05, **p<0.01, ***p<0.001.

Table A4.9 Exposure to conflict by age 19 and women's experiences of IPV using regional-level indicators of conflict

	All countries		Armenia		Azerbaijan		Moldova		Tajikistan	
	Full sample	Non-migrant	Full sample	Non-migrant	Full sample	Non-migrant	Full sample	Non-migrant	Full sample	Non-migrant
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Exposure to conflict at age 0-19	0.098	0.076†	0.020	0.014	0.010	-0.021	0.089†	0.094	0.046	0.089
	(0.07)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)	(0.04)	(0.04)	(0.06)
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Birth-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	17,787	9,447	2,724	2,038	3,186	1,504	3,773	2,545	8,104	3,390
R-squared	0.217	0.254	0.256	0.253	0.187	0.124	0.125	0.140	0.232	0.276
F test p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001

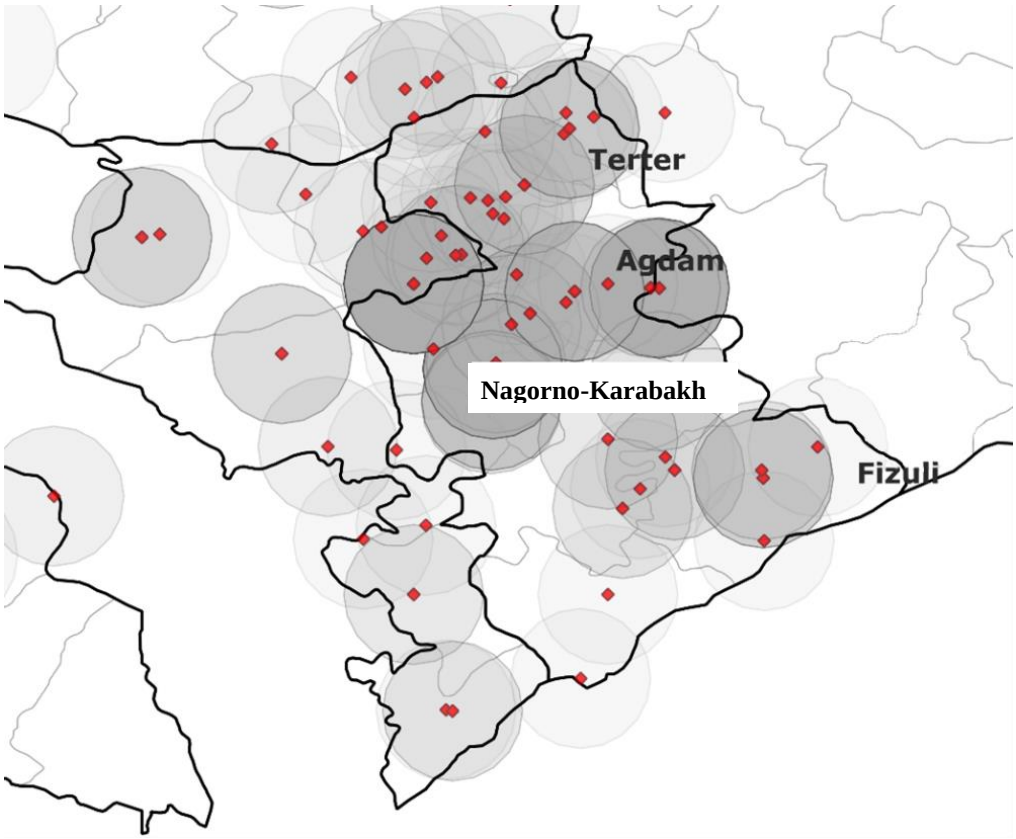
Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: The results are estimated using OLS. Regressions are weighted using survey weights for selection into the IPV module. Robust standard errors are clustered at the region level. Conflict-affected regions are: the Tavush region in Armenia; the Yukhari-Karabakh and Ganja regions in Azerbaijan; the Central region in Moldova, and the RRS, Dushanbe and Khatlon regions in Tajikistan. Controls include having a violent father, partner's alcohol use, education (9+ years), urban residence, spousal age difference (0 or husband younger, 1-5, 6+), age at marriage, children ever born and employment status. In odd numbered Columns the sample includes all women who were interviewed in the IPV module, and even numbered Cols. who never migrated from their location since the start of each conflict (for the Azerbaijani sample this includes IDPs/refugee and women who never migrated from Karabakh territories since 1991). †p<0.10, *p<0.05, **p<0.01, ***p<0.001.

Figure A4.1 Fatalities and violent events by conflict



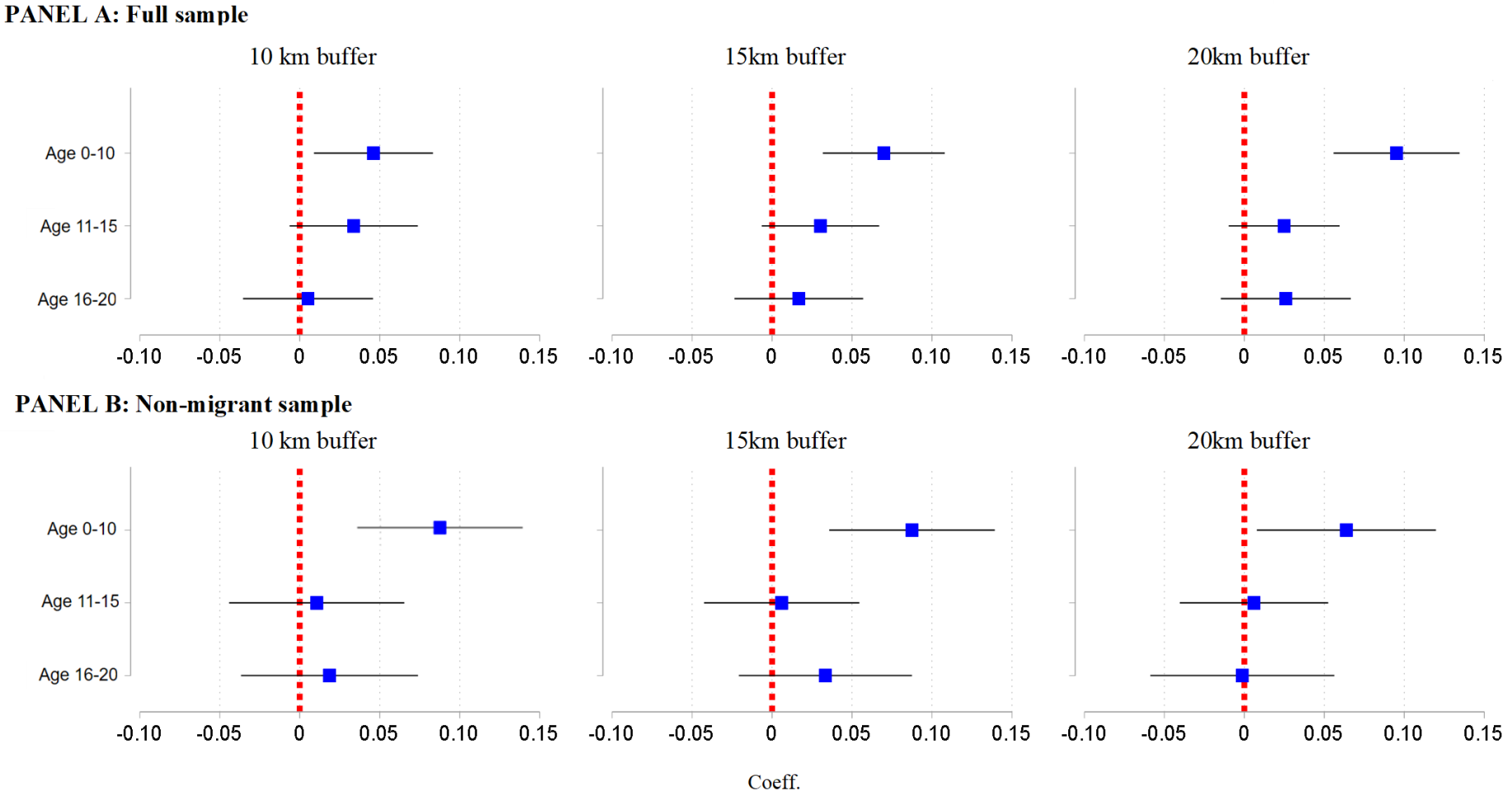
Source: UCDP-GED (2022) for conflict data. Fatalities as measured by UCDP-GED best-estimate.

Figure A4.2 Buffer (15km) around conflict events between 1992-1996 in Nagorno-Karabakh and in the partially Armenian-controlled districts of Agdam, Fizuli and Terter



Sources: UCDP-GED (2022) for conflict data. DIVA-GIS for map shapefile. Notes: The red diamonds represent conflict events, while the grey circles their 15km catchment areas. These cover almost entirely the geographical spread of the three partially Armenian-controlled conflict-torn districts of Agdam, Fizuli and Terter.

Figure A4.3 Results from models with different buffer radii – full (Panel A) and non-migrant samples (Panel B)



Source: Women recode of Armenia (2015), Azerbaijan (2006), Moldova (2005), Tajikistan (2012 and 2017) DHS. Notes: As per estimates from models using OLS weighted using survey weights for selection into the IPV module. On the left-hand figures, the conflict buffer has a radius of 10km from each conflict event; in the middle figures a radius of 15km (main specification) and of 20km on the right-hand figures.

Chapter 5

Conclusion

5.1 Findings of this thesis and their implications

This thesis was motivated by the paucity of demographic research studying the consequences of armed conflict on the family domain (Brunborg and Tabeau 2005; Hill 2004). Drawing on a multidisciplinary landscape of research on the population, health and gender outcomes of war, it focused on post-Soviet wars, and in particular on the conflict in Nagorno-Karabakh. Although these conflicts have been left at the margins of the demography literature, my findings show that they had important implications for family dynamics in Azerbaijan and lasting impacts on family violence in the post-Soviet space more broadly. This final Chapter summarises the overall findings and discusses their significance, along with limitations and lessons learned for future research.

5.1.1 Summary of the thesis

The point of departure of this research was an appraisal of available knowledge on how armed conflict can alter family processes. While demographers have made significant, and essential, efforts to document some of the gravest costs of war – excess mortality and forced migration – attention to questions of 'slower demography' (Billari 2022), such as whether and how armed conflict influences family dynamics, has been meagre in comparison. For long, this peripheral interest has been both the

result and the cause of poor availability of (high-quality) data that could support the production of evidence and was openly manifest in the case of the conflicts that occurred after the USSR collapsed, particularly the Nagorno-Karabakh war. This thesis contributed to the "conflict demography" literature and research on post-Soviet demographic changes with three empirical studies, each adding a piece that improves understanding and, hopefully, encourages greater focus on the population consequences of the vastly unresolved security vacuums that continue to affect the Eurasian region.

In the first study – *'Armed conflict and the timing of childbearing in Azerbaijan'* – I concentrated the attention on fertility, the primary determinant of medium-term population growth. I used several data sources and, in particular, exploited retrospective birth history data from the only available survey implemented in Azerbaijan after the Nagorno-Karabakh conflict to provide the first detailed account of fertility changes in the country since independence and in relation to the conflict with Armenia. I found that, since 1991, period total fertility declined steeply to almost below-replacement levels and that this was the result of a *'stopping-sooner'* behaviour. The conflict had little influence on such aggregate fertility trends. However, I found that it shaped differently the transition to different parities. Specifically, women affected by the Nagorno-Karabakh conflict had a higher risk of transitioning to the average parity level in the population, that in the Azerbaijani context was the second birth. Further, I observed fertility-'promoting' responses among displaced women who lost a child during the war, which suggested risk-insurance and replacement mechanisms as responses to deeply traumatic conflict-related events.

The findings feed the theoretical debate on households' childbearing behaviour and decision-making *vis-à-vis* conflict and uncertainty, and highlight the importance of considering each birth event independently and in relation to the population's stage in the fertility transition. In the case of Azerbaijan, where motherhood was universal and third (and higher) order births were already rare before independence, the second birth was the most susceptible to the 'promoting' impact of conflict. Overlooking response heterogeneity by birth transition and pre-conflict fertility patterns can thus give a misleading or, at best, incomplete picture of the conflict-fertility nexus, and in turn poor instruments to understand the mechanisms behind childbearing behaviour in conflict-affected populations.

In the second study – *'Armed conflict and female teen marriage in Azerbaijan'* – I used marriage history data to examine whether and how the Nagorno-Karabakh conflict altered teen marriage dynamics in Azerbaijan. Although it is often argued that armed conflict increases women's risk of marrying in early age, these claims are rarely supported by solid quantitative evidence. To the best of my knowledge, this was the first empirical test of the link between war and teen marriage at the cohort-level. I exploited spatial variation in conflict violence and a cohort specification accounting for the risk of marrying in teen ages before and during the war. I provided suggestive evidence of a negative link, particularly for the cohorts who were in their early teens as the conflict erupted. I further showed that this was plausibly connected to forced displacement. My findings thus caution against extrapolating evidence from qualitative studies which, while certainly providing rich insights into individual experiences and potential mechanisms, are unsuited to evaluate population-level relationships, as well as from small-scale quantitative research and studies focused only on overall marriage patterns. As for fertility, generalising from aggregate rates can be misleading and hide the behaviour of demographically important segments of the population, like adolescents.

Although the results add new and perhaps 'welcome' evidence on early union formation in times of violence and in relation to different stressors and sources of insecurity, they also signal that adverse marriage outcomes for conflict-affected women may occur just a bit later than adolescence. The conflict only led women to delay their marriages into their early 20s and this postponement was associated with larger age and educational disparities with their husbands. This may be worrisome because both educational heterogamy and wide spousal age gaps can create the conditions for less equitable marriages, and women with considerably older and less educated husbands tend to be more exposed to negative social and health outcomes (Mabsout and Van Staveren 2010). In conflict settings, these women may also be more likely to be victims of domestic abuse (La Mattina 2017).

In Chapter 4 – *'Young-age exposure to armed conflict and women's experiences of intimate partner violence'* – I, therefore, moved from family formation and enlargement to explore family interpersonal relationships. In specific, I examined the legacy of experiencing conflict in developmental ages on women's later risk of IPV victimisation. Although early-life experiences of

violence are established predictors of later domestic abuse and exposure to conflict has been related to increasing IPV, the potential for a long-term link between these two experiences of violence had not yet been evaluated. Broadening the substantive research context to include the four countries in which conflict violence erupted as the USSR collapsed, and combining survey and conflict data, I compared the IPV outcomes of women who experienced conflict before the end of their teens with not-exposed peers and older women. I found that young-age exposure to war was associated with a greater later risk of IPV. Experiencing conflict in childhood in particular had the strongest consequences, especially for physical forms of abuse from partners. In testing potential pathways, I found that women who experienced conflict in childhood were more likely than any other group to have a violent father. This result possibly indicates that armed conflict has 'immediate' implications for the behaviour of men in the domestic realm, and in turn for the next generation. In fact, results also showed that men exposed to war in late adolescence were more likely to condone violence against female partners, whereas there was no such association for women. Although attitudes do not necessarily translate into behaviour, they exert a strong influence on actual actions. I argued that men who experienced conflict in ages when they would be more likely to be mobilised and fight possibly modelled their later-life beliefs and value system (and, presumably, behaviours) on what they learned on the battlefield.

More broadly, this paper showed that, by creating cohorts more likely to experience and condone IPV, war can have lingering consequences on the family domain even long after violence has subsided. As a first empirical investigation of the inter-linkages between the two forms of violence within a long-term perspective, this study contributed to our theoretical understanding of the 'slow' consequences of war on the family domain and added a novel piece to the vast literature on the role of early-life events for adult outcomes.

5.1.2 Implications

The family is the most basic social unit, where most demographic events occur. It represents the first source of care and socialisation for children; a safety net and primary consuming unit for young and middle-aged adults, and a crucial resource for support for older generations (Manning 2015). In the

context of armed violence, it is also fundamental for individual resilience and ground-up peacebuilding. For these reasons, the evidence presented in this thesis offers some lessons for researchers, as well as for policy-makers and relief agencies wishing to design initiatives to support women and families in the studied contexts and, perhaps, similar settings in Eurasia affected by armed violence, like Ukraine and the North Caucasus.

My analyses of fertility and marriage transitions in Azerbaijan showed that conflict violence can affect the family trajectories of women and girls in ways that are concealed by aggregate trends. Appropriate contextualisation and disaggregation of information by each family transition event and by the type of conflict experience should be central to the development of plans and deployment of resources for family planning programmes in situations of lingering conflict and displacement. In acute phases, activities that ensure basic support – such as those outlined in the Minimum Initial Service Package for Reproductive Health in Crisis Situations – should and can be implemented without an in-depth needs assessment. However, as crises become protracted, policy intervention should be increasingly built on data disaggregated in a context-sensitive manner. This is crucial to avoid missing important information about the distinctive needs of conflict-affected women, or of any other group, and to ensure the much-advocated transition from emergency to tailored programmatic service provision (Tran and Shulte-Hillen 2018). Chapter 2 on fertility emphasised this aspect in particular: ignoring that conflict-affected groups may be at a different stage in the fertility transition can lead to resource mobilisation that is misaligned with actual needs, and in turn have implications for long-term stability and recovery.

Similarly, inasmuch as Chapter 3 provided perhaps surprisingly ‘positive’ evidence on early marriage, the result needs to be appraised through the lenses of the peculiar combination of armed conflict and the transition to a new socio-political regime. Results also did not exclude adverse marriage outcomes for conflict-affected girls from happening just a bit later than in adolescence. The humanitarian community would benefit from considering all these multifaceted aspects in future responses. In this sense, assisting young women with training opportunities and income-generating programmes can be helpful to decrease vulnerability to unwanted marriage arrangements that armed

violence may have only temporarily halted.

Another policy-relevant implication of this work relates to the hidden inter-linkages between different forms of violence. My findings suggest that interventions seeking to address the consequences of war on the family domain should incorporate and be driven by the idea that *"violence begets violence"*. Acknowledging that conflict violence may endure and trigger subtler types of violence, even long after fighting has ceased, is important to anticipate post-conflict increases in interpersonal violence and can serve local health systems, clinicians and service providers to better support victims of IPV in war settings. This evidence can also be useful to international donors and organisations concerned with GBV to advocate for greater mobilisation of funding and more explicit inclusion of specialised IPV prevention, mitigation and resilience programmes in war-affected populations. In this sense, my findings suggest that initiatives focused on early violence screening, trauma healing, and de-escalation can be promising in reducing IPV in theatres of war (Spangaro et al. 2021).

Relatedly, the results should steer policy attention to the detrimental, long-term harms armed conflict inflicts on men (besides direct excess mortality). Although an exhaustive exploration was beyond the scope of this dissertation, Chapter 4 provided some evidence that conflict can have injurious consequences on both men's immediate behaviour and long-term beliefs about violence, particularly for boys on the threshold of adulthood. This calls for approaches that can challenge the toxic masculinities that armed conflict generates and for programs that can help male survivors to develop techniques for non-violent conflict resolution. More broadly, these novel findings underscore the need to think about responses to the damages created by armed violence with gendered lenses, and with initiatives addressing both its tangible and less visible by-products, such as attitudes towards violence.

Acknowledging the connection between 'public' and 'private' violence is of utmost importance for peacebuilding and long-term reconciliation programmes. By affecting the stability of the family unit through increased IPV, war also undermines the foundational building block to education, health, gender equality, and many other elements central to the Sustainable Development Goals for children born to conflict-affected couples. Considering this intergenerational aspect during the reconstruction

phase is crucial to disrupting 'cycles' and 'ripples' of violence that would otherwise impede full healing and recovery. More generally, the findings of Chapter 4 represent a reminder that violence can be transmitted across individuals, groups, and generations through social learning. If the goal is truly to achieve sustainable peace, peacebuilding efforts and harm-reduction strategies should increasingly seek to move away from a 'narrow' focus on public violence and violence perpetrated by combatants and include all actors and domains of violence (Kelly et al. 2018).

All the above is particularly relevant for Azerbaijan. Over the past two decades, the government of Azerbaijan has actively assisted conflict-affected communities, IDPs in particular, with programmes catering to their educational and housing needs (ICMPD 2018; IDMC 2014; UNECE 2005). By contrast, interventions directed specifically to women and the family, including family planning, counselling services, and awareness campaigns against early family transitions and domestic violence, have remained absent from the institutional agenda (Amnesty International 2007; IDMC 2007, 2010; UNFPA 2019). Findings in Chapter 2 perhaps offer an indication of some unmet need for reproductive health services in displaced communities and conflict-affected locations, and thus of this lack of institutional focus. This, together with a poor implementation of marriage laws, and traditional expectations around gender roles and female sexuality, likely contributed to the recent growing incidence of early marriages in the country, and specifically in IDP communities (Twum et al. 2019; Girls Not Brides 2021; UNICEF 2020). This trend is of concern, especially in light of the confluence of Covid-19 and the 2020 re-escalation of violence in Nagorno-Karabakh. The 44-days conflict that took place between September and November 2020 displaced many households living nearby the line of contact in Upper-Karabakh, hampering women and girls' access to already limited reproductive, maternal and family health services (ACAPS 2020). In these areas, violence further disrupted civic infrastructures, including internet connections and TV broadcasting activities. Needless to say, this made distance-learning during the concurrent first wave of Covid-19 an unviable option for girls and boys in zones affected by bombings and violence, while it was already complex to ensure access to online classes for IDP families and children due to the lack of devices, limited

connectivity and low levels of digital literacy (UNDP 2021).[1] As in the early 1990s, the outbreak of armed conflict in the midst of another crisis may have repercussions for the marriage trajectories and life chances of many Azerbaijani women and girls, their security and the stability of families. Looking ahead, the findings of this thesis can serve as a starting point to understand these impacts and perhaps mitigate adverse ones.

Finally, a broader reflection relates to the data and approaches used in this work. Despite the undeniable complexities of conflict environments and data concerns, I hope that this thesis demonstrated that there are opportunities that can and should be taken to elucidate the consequences of war on the family with existing, publicly available data and with relatively simple methodologies. Evidently, this requires data scoping, sifting and a good degree of creativity, and it is not free from limitations. It also does not imply that we should be satisfied with the data and tools we currently have. However, existing data can go a long way to produce trustworthy results and should be exploited more frequently. Wider utilisation would make the research community increasingly aware of their advantages and practical limitations, incentivise scholars in the field to promote best practices, and eventually catalyse interest and resources for the collection of data purposely designed for the study of conflict (Brück et al. 2016).

5.2 Limitations and directions for future research

Along with contributions and implications, this thesis also has its limitations, and many unanswered questions remain for future studies.

First, given the settings and the timing of the conflicts under study, all the results presented in this project are to be understood and interpreted as the product of the peculiar and concurrent combination of armed conflict and the transition to new socio-political regimes. Although it was not possible to disentangle the role of each crisis with the data at hand, I leveraged all available survey information

[1] Since the government declared Covid-19 a pandemic in March 2020, all educational institutions were closed, and classes moved to online and broadcast formats. Distance-learning was kept in place for most of the year, including in the months of September and November when the re-escalation of the conflict around the territories of Nagorno-Karabakh broke out.

and different methodological strategies to provide credible evidence that conflict violence, above and beyond the socio-economic crisis, was associated with changes in family-related outcomes. Future research could delve deeper into the relative contribution of each crisis, expanding present findings with qualitative in-depth interviews and focus groups with war-affected cohorts who were young during the transition. In this respect, the concomitant outbreak of Covid-19 and the 2020 re-escalation of violence in Nagorno-Karabakh offers a good opportunity to use and examine the effectiveness of mixed-methods approaches in the study of family change in times of multiple crises in Azerbaijan. Co-occurring crises further imply that the results of the studies are not necessarily generalisable to settings outside the former Soviet bloc. Nevertheless, they represent a point of departure for understanding family dynamics in contexts with similar socio-institutional settings and unresolved conflicts.

Second, the bulk of this project focused on answering 'whether' and 'how' questions, mostly because data were not sufficient to dig into the 'whys'. For example, it would have been possible to test some of the channels driving the declines in early union formation observed in Chapter 3, if detailed information on union characteristics, women's parental background and/or data to calculate pre-post conflict local sex-ratios had been available. Similarly, I would have provided a more comprehensive analysis of the pathways behind the observed increases in IPV after conflict exposure in Chapter 4 if, for instance, the DHS had collected samples of men large enough to enable matching. A core objective of future research should thus be to test the mechanisms and disentangle their relative importance. This is fundamental to theory development and policy assistance.

Third, measuring conflict exposure at the micro-level is associated with significant challenges. As research on armed conflict grows, new technologies in data collection and analysis (e.g., satellite and geo-referencing capacities, big and social network data, and machine learning techniques) currently offer more tools than ever before for measuring conflict and studying its implications for individuals and families (Verwimp et al. 2019). In this fast-evolving context, single measures, even if directly collected from respondents (e.g., indicators based on displacement status) may not fully capture the real extent of 'conflict-exposure', whereas measures that do not differentiate across conflict events

(e.g., gun battles from bombings or indiscriminate shelling) may only provide a crude indication of the more nuanced experiences of violence people have and of the diverse meanings they attach to each war event (Williams et al. 2012). Likewise, matching conflict events to survey respondents by a spatial buffer is not bereft of limitations, although it is considered one of the most advanced techniques for measuring conflict exposure when information directly collected from survey respondents is not available. Counts of conflict events and fatalities only represent 'extreme' proxies for the much wider implications war has on populations. There is always a degree of arbitrariness (e.g., in the choice of "catchment area" radius) and the possibility of underreporting. Although the UCDP-GED records data through a solid process of triangulation of information, the dataset only includes events of organised violence that are covered by media and NGOs reports. This means that no information is collected on other incidents of war such as infrastructure damage, landmine or looting and that the dataset may underestimate the real extent of armed violence, especially in remote areas. All these issues are exemplified by the fact that even among the many valid studies using UCDP-GED data, there is no uniform definition or consensus on how to measure conflict exposure.

My measurement approach was based on a theoretical and statistical exploration of a suite of alternative indicators that mixed different data sources, with the ultimate goal of identifying measures that most meaningfully captured conflict exposure given the context and available data. For example, even if geo-referenced survey data for Azerbaijan had been available, I would have still considered using measures based on DHS questions on conflict displacement given the mismatch between UCDP-GED death estimates and the numbers provided in historical sources. Similarly, while UCDP-GED data match more closely the narrative accounts of the other two conflicts, I chose to rely on event-based measures rather than fatalities to be better 'protected' against data inaccuracy and because they provided better model fit.

Naturally, it is not ideal to work with conservative indicators 'protecting' against potential issues rather than exploring in depth the phenomenon of interest, and one would like to have consistent measures capable of picking up multiple dimensions of violence. Including a validated Conflict Exposure Module in standard household surveys as proposed by Brück et al. (2016) would be an

important investment for future research in the field. Not only would such a module support more realistic measures of conflict based on respondents' direct experiences and on data collected in an ethical manner that minimises risks to both interviewers and interviewees; it would also enable researchers to gain a more sophisticated contextual understanding of the mechanisms, and compare responses across diverse instances of violence. In the meantime, as Svallfors (2021a) rightfully noted, researchers approaching the field of "conflict demography" should continue to dedicate time to evaluating the theoretical, contextual and statistical relevance of different operationalisations before adding conflict-related variables into their regression models. Comparing and contrasting coding rules would be also instructive because differences and similarities "map out the space within which we might be able to find a shared understanding of war" (Sambanis 2004: p. 856).

Aside from the challenges involved with measuring conflict, the analyses suffer from limitations common to most "conflict demography" research. By default, survey data exclude those who suffered the greatest costs of war, i.e., those who perished or were displaced internationally. All we can observe are the lower-bound impacts of war on survivors. Because of the nature of the 'treatment', in no way I could deliberately assign interventions to respondents, and neither could I exhaustively explore pre-conflict trends in the outcomes or follow the same individuals before, during and after the conflicts with observational cross-national data. Although I performed a range of sensitivity checks to ensure the robustness of my findings, all these factors hindered clean causal identification. In this respect, longitudinal data represents an indispensable data collection goal for conflict demographers. Already a decade ago, Axin et al. (2012) demonstrated that with cheap operational strategies it is possible to produce good quality longitudinal data from conflict-affected populations. This type of data, together with a Conflict Exposure Module in standard household surveys, would unlock many doors of opportunities, including testing model assumptions, examining selection issues and making more confident causal claims about how exposure to conflict alters demographic behaviour over time. The importance of such data collection efforts cannot be overstated.

A final, more general consideration concerns the experiences and consequences of armed conflict for men, which this thesis considered only marginally in Chapter 4. Since the family processes I analysed

are inherently interactional and dyadic, an important research avenue consists in expanding the focus to include the family trajectories of war-affected men and boys and comparing them with women's experiences. Because of data limitations, the present thesis also anchored its questions around 'traditional' family structures and transitions, but a kaleidoscope of new family patterns and arrangements is rapidly emerging worldwide (Manning 2015). Research broadening the scope to diverse family forms – including LGBT families, complex households and living apart together unions – is key to a comprehensive and more nuanced understanding of how armed conflict intervenes and shapes the contemporary landscape of family processes.

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