

The long-term effects of civil war on reproductive health in Tajikistan

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Abstract

The relationship between war and reproductive health is complex and multifaceted. Much of the prior research has focused on contemporaneous effects and human rights violations. In this article, I examine the long-term consequences of the 1992-1997 civil war in Tajikistan on abortion and miscarriages, critical components of reproductive health. Using conflict event data from the Uppsala Conflict Data Program and individual data on women in Tajikistan from the World Bank, I estimate zero-inflated negative binomial models, while offsetting for the number of pregnancies a woman experienced. In this analysis, I find that war increases abortions and miscarriages. These effects, however, are short-term for abortion, but for miscarriages persist during the decade after the war ended. The findings suggest that while there were behavioral responses that affected individuals during the civil war, the institutional and environmental repercussions of armed conflict continued to affect reproductive health, a decade after the war ended.

Introduction

In the 1990s, following the collapse of the Soviet Union, Tajikistan was devastated by a brutal civil war, which killed tens of thousands and displaced an estimated million people from their homes. While some research has examined marriage patterns during and after the war (Shemyakina 2013), we know less about ways that war affected reproductive health. In high fertility, developing countries, such as Tajikistan, “demographic theory is ambiguous with respect to the likely effects” of war on fertility (Lindstrom and Berhanu 1999:247). While a growing body of demographic literature has begun to address short- and long-term fertility responses to political crises and conflict (Agadjanian, Dommaraju, and Glick 2008; Agadjanian and Prata 2002; Blanc 2004; Caldwell 2004; Islam et al. 2016; Urdal and Che 2013), the same cannot be said for assessing the long-term consequences of conflict on reproductive health. Much of the research on the relationship between armed conflict and reproductive health has focused on the contemporaneous cases – that is, the most pressing and urgent needs for reproductive health among vulnerable conflict-affected populations, especially refugees (Black et al. 2014; Chi et al. 2015; McGinn 2000). This important line of inquiry has policy implications to be sure, but without additional work to examine the long-term consequences of armed conflict for reproductive health, this story is incomplete.

Using the case of the 1992-1997 civil war in Tajikistan, this article examines reproductive health – specifically abortion and miscarriage – in the decade following the signing of the peace accord. I use data on approximately 5,000 women from the Living Standards Survey conducted in Tajikistan in 2007 combined with event data from the Uppsala Conflict Data Program to assess the likelihood of experiencing pregnancy loss for women in conflict-affected areas of Tajikistan – even for those who were well under the age of marriage or reproduction at the time of the conflict. The findings suggest that while abortions temporarily increased during the conflict, the likelihood of miscarrying persists into the younger cohorts, with conflict-affected women more likely to miscarry than those in non-conflict affected areas. The implications of these findings suggest that after armed conflict, an interaction between individual

behavioral response and institutional destruction and decay have serious ramifications for reproductive health.

Background

Reproductive Health in the Aftermath of Armed Conflict

The lived experience of armed conflict does not end at the signing of the peace accord. The legacy of war affects a wide range of social, economic, and political institutions, it fundamentally changes a generation of men and women, and the way that those men and women assess risk and make decisions. The shadow of war lingers over social networks and formal institutions. The winning side controls power structures within the state and seeks to reward those on their side and penalize the opposition. Risk and uncertainty are recalculated over and over by those who survived. Those who fled may choose not to return. The life expectancy for men drops. Husbands die. Couples are separated. Women are raped. Stress and trauma interrupt healthy lives, and further, health institutions decay, sometimes in tandem with the destruction of infrastructure.

Beyond infrastructural damage, the collective experience of organized violence becomes embedded in the institutions of a community. Population health suffers when hospitals and clinics are bombed, when roads are blocked or destroyed, when trained health care workers flee, and when resources such as supplies and funding are diverted to the battlefield. Political will may not be strong enough to provide resources for public health services during times of crisis. Asymmetric reconstruction in the aftermath can deeply debilitate the ability for these institutions to recover from damage and decay. Worse, as the institutions falter year after year, it is not only buildings that decay but social trust in the efficacy and safety of a service.

Reproductive health is one component of overall well-being. The World Health Organization (WHO) defines reproductive health (RH) as the ability for men and women “to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if,

when and how often to do so.¹” Reproductive health, like overall health, it is threatened in various ways by armed conflict.

Much of the research addressing the relationship between conflict and reproductive health has approached the issue as a humanitarian task required for displaced and refugee populations (Austin et al. 2008; Black et al. 2014; McGinn 2000; Reese Masterson et al. 2014). In these contexts, the research makes a call for improved policies in providing access to reproductive health for refugee and returnee populations. However, as McGinn (2000) notes, many of the RH risks associated with conflict are not limited to these populations.

Research that specifically focuses on the relationship between conflict and abortion has primarily approached the issue from a human rights perspective, in which forced abortion is a human rights violation that affects other health outcomes like life expectancy for women (Gardam and Charlesworth 2000; Plümper and Neumayer 2006). However, in many developing contexts, and especially in the former territories of the Soviet Union, abortion is a widely-used alternative to contraceptives. In contrast to hormonal contraceptives like the birth control pill, abortions require only one point of contact with a health practitioner, whereas the pill requires a consistent supply and frequent contact with healthcare institutions. During armed conflict, this may be impossible or impractical.

After conflict, as individuals begin to recover from exposure to violence and instability, healthcare institutions may take much longer to resupply medicine and equipment. These changes can lead to poor access for abortion care, but can also lead to poor preventative care, leading to more miscarriages. In this study, I examine the relationship between conflict and abortion and miscarriage. Does exposure to armed conflict affect the rate of pregnancy loss? When pregnant, do women make different choices about abortion, or does their choice set become restrained due to institutional decay, particularly in the public health sector? Further, do these changes persist beyond the conflict itself?

¹ Retrieved from http://www.who.int/topics/reproductive_health/en/

The problem

Why does this relationship matter in post-conflict and transitional societies? First, micro-level changes to abortion and contraceptive use during armed conflict can predict macro-level changes in fertility. War and family formation have a complex, multi-faceted relationship. This complexity is perhaps best illustrated by results showing opposing and even null effects of armed conflict – in some cases that armed conflict accelerates fertility decisions (Lindskog 2016; Urdal and Che 2013), in others that it postpones them (Agadjanian and Prata 2002; Heuveline and Poch 2007; Williams et al. 2012), and in yet others, that even in the midst of conflict, both marriage and fertility remained “remarkably stable” (Randall 2005). By focusing on reproductive health, this research provides insight into one of the plausible components of the complex relationship between armed conflict and fertility.

Second, understanding this kind of institutional change is critical to post-conflict rebuilding. Policy-makers concerned with efficient spending on public health programs can use better and deeper understandings of behavioral responses combined with the institutional changes in the aftermath of armed conflict to target health interventions at the subnational level. Because conflict, development, education, religiosity, and health outcomes tend to vary on the subnational level, I expect to find corresponding regional differences in individual decision-making and access to healthcare. It is in these conflict-affected areas that health interventions may be both the most pressing and less commonly pursued, leading to poorer health and a higher likelihood of miscarriage.

The Case of Tajikistan

Located at the south end of Central Asia, Tajikistan is a small, land-locked country that was once part of the Soviet Union. It shares borders with Afghanistan to the south, with China to the east, and with Kyrgyzstan and Uzbekistan in the north. The map below (Figure 1) includes the five regions (Sughd, Dushanbe, Khatlon, the Regions of Republic Subordination, and the Gorno-Badakhshan Autonomous Oblast).

[Figure 1 about here]

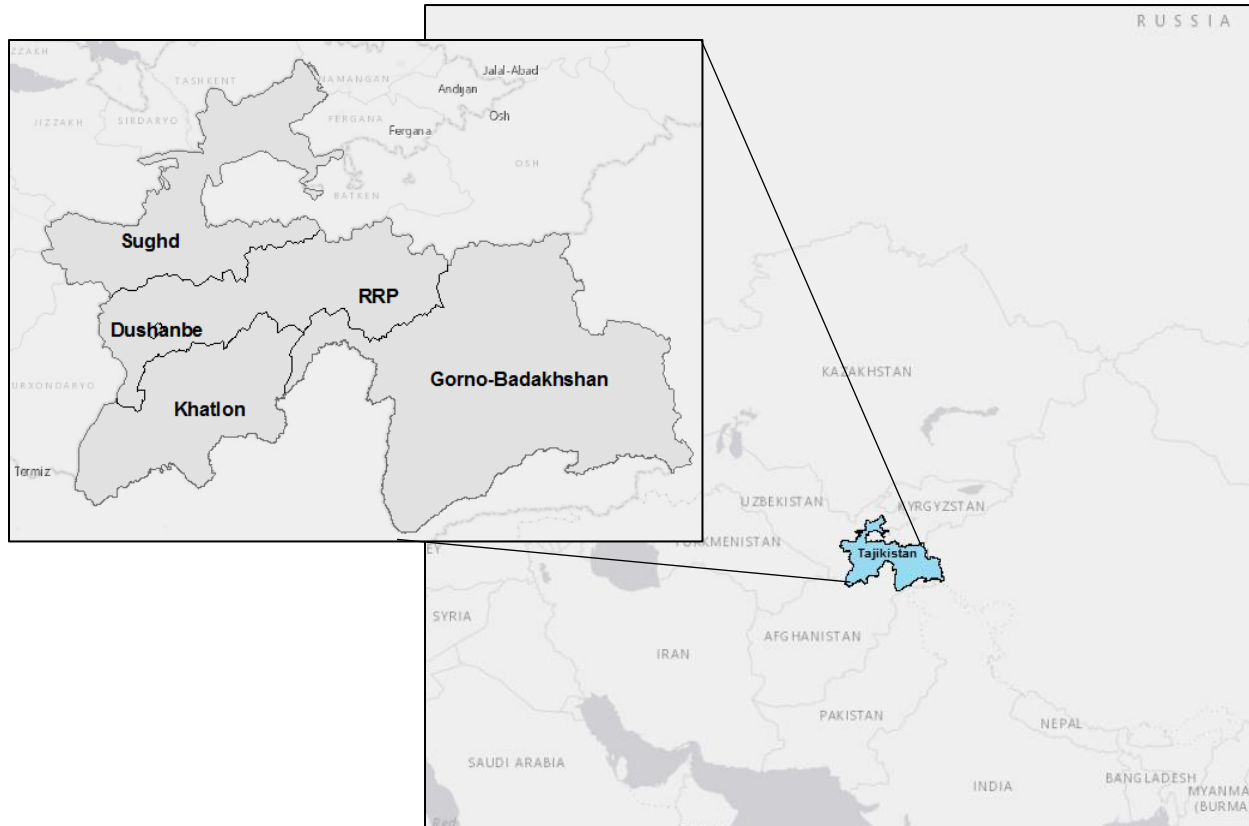


Figure 1: Location of Tajikistan in Central Asia and Regional Divisions within Tajikistan

Half the population of Tajikistan are living under the poverty line. Migration is a common livelihood strategy and official remittances constitute half the national GDP. Only 6% of the land is considered arable, and any further agricultural development has been stifled by mass migration, leading to widespread food insecurity (Laruelle and Peyrouse 2013).

Tajikistan is an ideal case to examine the relationship between armed conflict and abortion in the context of institutional change. After independence, many Central Asians lamented the decay of the formal institutions built by the Soviets (see Froese 2008 on education). Relative to the starting points of other post-colonial nations, the Soviet legacy gave Tajikistan a ‘head start’ in many ways. Although in

purely economic terms, Tajikistan was one of the poorest former Soviet states when the USSR collapsed, other indicators like literacy, life expectancy, and the Human Development Index (HDI) were more comparable to ‘medium’ income countries than the economic peers in the region like Iran and Pakistan (Falkingham et al 1997, Falkingham 2000). Healthcare was particularly strong in the Soviet era. Prenatal care was free and comprehensive. The ratio of physicians per 100,000 population was 255 in 1990, comparable to average rates in the European Union at the time (Khodjamurodov et al. 2016). Health-care institutions were embedded in everyday life, and their decline since independence has had meaningful implications for public health.

Scholars and policy-makers often consider declines in health in Tajikistan as a function primarily of the transition from the Soviet era to independence, but rarely incorporate indicators of exposure to armed conflict when assessing contemporary public health outcomes (Falkingham 2003; Khodjamurodov et al. 2016) When the Soviet Union collapsed, so did access to free and comprehensive health care (Khodjamurodov et al. 2016). Certainly, the political transition was important for women’s health, including contraceptive use and abortions. This research asks whether exposure to armed conflict matters *in addition to* the political transition for the readiness and ability of women to terminate unintended pregnancies.

This study utilizes subnational variation in conflict events in the case of Tajikistan, along with individual-level survey data from women ages 15-49, surveyed in the 2007 Tajik Living Standards Survey (LSS) to examine the relationship between armed conflict and reproductive health. The survey includes self-reported counts of pregnancies, abortions, and miscarriages. Employing these responses instead of official abortion rates allows for more insight into poor and rural areas, where women are often making healthcare decisions without professional consultation or assistance.

Civil War

The Tajikistani civil war began a few short months after independence from the USSR, as Soviet subsidies fell away, diminishing the already scarce resources that were insufficient for the growing population (Lynch 2001). After declaring independence in December 1991, along with many other Soviet Socialist Republics, the interim government lasted only a few months before opposition protests began, and martial law was declared in Dushanbe (Nourzhanov and Bleuer 2013). Widespread discontent over institutionalized corruption had provoked unexpected alliances, such as between the moderate Ismaili Muslim sect in Gorno-Badakhshan in the eastern part of the country and the then-banned Islamist political party called the Islamic Renaissance Party of Tajikistan (IRPT) (Driscoll 2015; Dudoignon 1997). This unexpected alliance was distinctly anti-Soviet, and positioned against the northern elites from Khujand, who rallied around the incumbent (and Soviet-backed) Rahmon Nabiev. The economic shock of the collapse of the Soviet Union brought with it hunger and job scarcity; Tajikistan remained the poorest former socialist republic, and without important subsidies from Moscow, conditions deteriorated. By April 1992, an estimated 100,000 protestors filled the main square in Dushanbe, demanding that Nabiev resign (Nourzhanov and Bleuer 2013:300). Violence in Dushanbe began in May as the IRPT began arming demonstrators (2013:316). Violent events were widespread through 1992 and 1993, primarily in Qurgonteppa in the southwest, the home base of United Tajik Opposition (UTO), in the Rasht Valley, home to the Gharimi opposition, and in the Gorno-Badakhshan Autonomous Oblast. The northern Soviet-era elites in Khujand allied themselves with the rural poor in southern Kulyob. Alliances shifted regularly, ceasefires were rarely followed, and all sides took part in violence against one another, as well as violence against civilians. Gun battles between armed groups were fought in villages, towns, and mountainous regions along the border with Afghanistan. Noncombatants and peacekeeping forces alike were shot in bazaars and their vehicles rigged with explosives (Pannier 2017). The violence peaked in 1993, but continued on intermittently for the next four years, until a peace agreement was finally signed in 1997, between the new president backed by the Khujand-Kulyob alliance, Emomali Rahmon, and the leaders of the United Tajik Opposition. The peace process was facilitated by military and political intervention from

both Russia and neighboring Uzbekistan, each of which having a vested interest in regional stability (Horsman 1999).

In all, the conflict resulted in substantial human and material losses. In a country with a population then of a little more than 5 million, experts estimate that between 20,000 and 60,000 were killed, and up to a million people were displaced within Tajikistan and to neighboring countries (Olcott 2012). The conflict caused widespread damage to infrastructure, institutions, and private dwellings. UNICEF estimates that nearly 200 primary schools were destroyed and between 2 and 12% of household structures were damaged in the conflict across the various regions (Shemyakina 2011). During the conflict, foreign and domestic investment in the economically important mining industry in Tajikistan practically came to a standstill (Levine 1996). Both during and after the conflict, regional divides were salient, producing “a highly regionalized pattern of politics... [and] an unusually high degree of congruence between patronal networks and territorially defined populations,” (Hale 2014:154). This regionality is an important factor during the post-conflict reconstruction period, in which Rahmon’s closest allies were rewarded and the territories that supported the major opposition groups were penalized.

Abortion Practice during the Soviet Era

During the Soviet era, hospital care and acute curative treatments were practiced far more than preventative medicine (Khodjamurodov et al. 2016). This bureaucratization of health care permeated all sectors of medicine, including maternal health. Traditional midwives were, and continue to be, considered “dangerous to the health of mother and child,” and births occurring outside a healthcare institution are punishable under the law (Roche 2016:213). This is not to say that home births and traditional medicine are not practiced – maternal health care services are much less likely to be utilized by women with less education and fewer resources to pay the high formal (and informal) fees associated with comprehensive care (Falkingham 2003). As part of maternal health care, access to and the use of induced abortion follows both trends of bureaucratization and of increasing disparities in access.

From the mid-1950s on, abortion was widely available and used as a primary method of birth control in many parts of the Soviet Union (Agadjanian 2002; Remennik 1991). By the early 1980s, illegal abortions were still commonplace, prompting the Soviet government to issue a decree that allowed abortion to be induced through the 28th week of pregnancy for certain medical reasons (United Nations Population Division 2002). The ease of access to and the lack of stigma around abortion was broadly seen as emancipatory for Soviet women, but came with a number of complications – not least of which was the recurring absence of modern birth control due to the overreliance on abortion (Agadjanian 2002:237–38).

Abortion Practice in post-Soviet Tajikistan

In spite of the fall of the Soviet Union, abortion in Tajikistan remains legal, relatively free of social stigma, and commonly practiced. First trimester abortions for any reason have been legal in Tajikistan since 1955, placing it in the ‘broadly legal’ category of abortion policies and setting it apart from many other majority Muslim countries (United Nations Population Division 2002). Rates in Tajikistan are not the highest of the former Soviet Union. Eastern European countries and Russia have historically had much higher ratios of abortions to live births, while Kyrgyzstan and Uzbekistan are more comparable to Tajikistan. Still, the former Soviet Union has been described as having a strong “abortion culture,” even in Central Asia. (Agadjanian 2002). At least in some places in Tajikistan, qualitative evidence suggests that abortions remained a primary method of birth control through 2000 (Tajikistan Ministry of Health 2000). Between 1990 and 2014, abortion rates across Central Asia remained fairly stable (Sedgh et al. 2016). In Tajikistan, there was an overall decline in abortion rates, but this decline began after the civil war, with an *increase* during the war (see Fig. 2).

[Figure 2 about here]

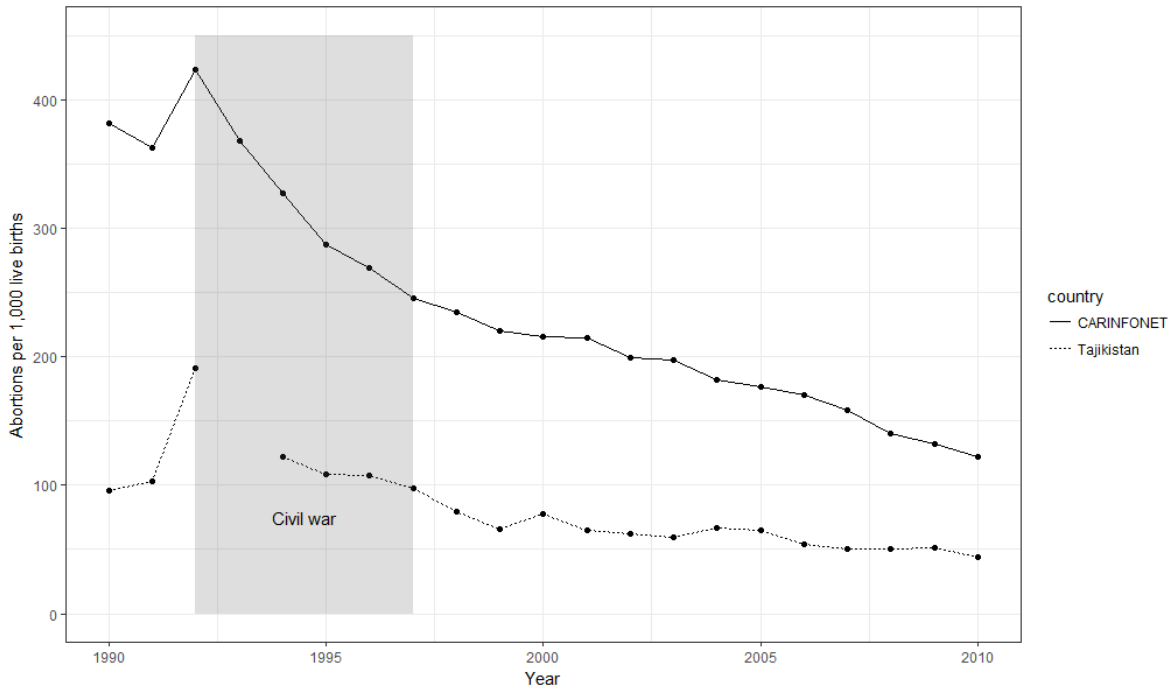


Figure 2. Trends in Abortion Rates for Central Asian Countries and Tajikistan (Source: *European Health for All (WHO) 2015*; NB Data for 1993 Not Available

Since independence, the healthcare system in Tajikistan has suffered both from the infrastructural devastation of the civil war and from the loss of Soviet policies and subsidies. After the war ended in 1997, private fee-based healthcare facilities were introduced, and in 2003 the government removed the constitutional right to free health care and introduced fees for state-run health services. Through the mid-2010s, there was little investment in existing Soviet-built infrastructure, and regional disparities in access to and quality of medical facilities is stark.

Basic human resources have suffered since independence, as well. The number of physicians, nurses, and midwives per capita have precipitously declined since 1990, with steep decreases during the war and no recovery in sight by 2013. Some occupations, like pharmacists, declined during the war but eventually recovered (Khodjamurodov et al. 2016). Figure 3 shows the changes in health expenditures over time, which fluctuated during the war and never fully recovered to Soviet-era levels (Falkingham 2000). In short, material and human capital in the health care system in Tajikistan has suffered since

independence. These institutional deficits are associated with troubling public health outcomes, such as increasing maternal and infant mortality.

[Figure 3 about here]

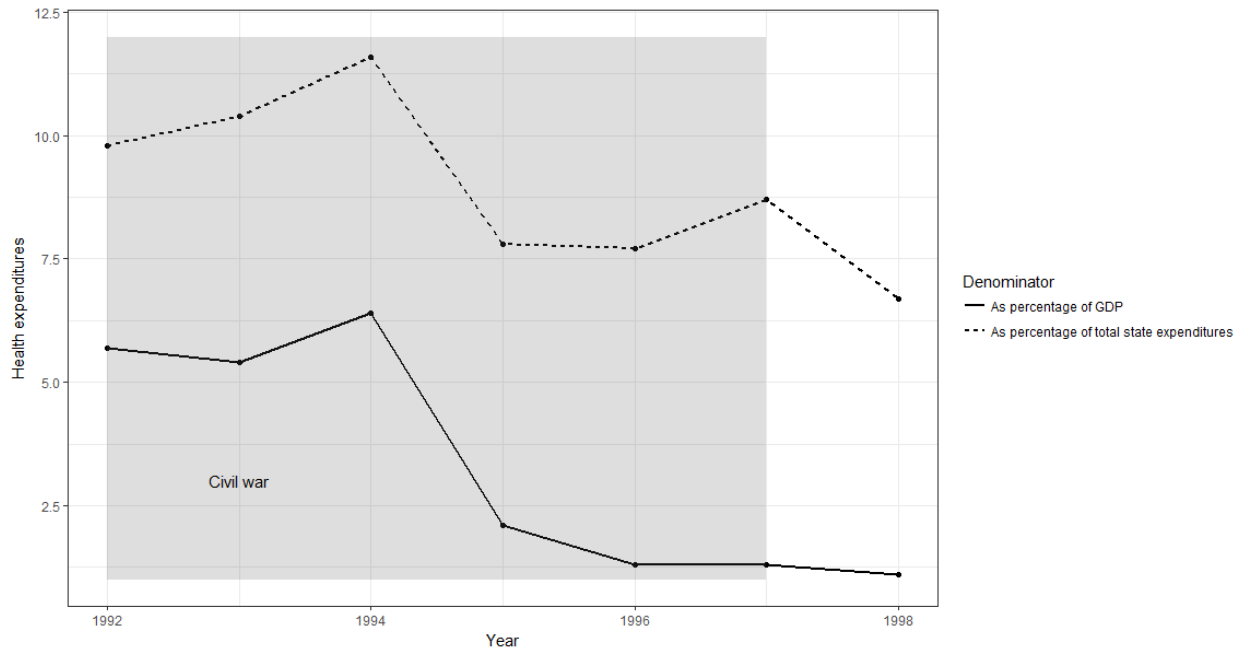


Figure 3: Trends in total health expenditures as a percentage of GDP and government expenditures, 1992-1998

Since independence, abortions continue to be allowed for any reason through the first trimester, and with medical or social reasons through the 28th week (United Nations Population Division 2002). Although there has been some decline in nationwide abortion rates since independence, evidence from survey data shows that of all women who had ever been pregnant, 12.6% in 2005, 11% in 2007, and 10% in 2012 had experienced at least one abortion (Statistical Agency under the President of the Republic of Tajikistan; Ministry of Health, Measure DHS, ICF International 2013).

Data

To examine this question, I use the women’s questionnaires in the 2007 Tajikistan Living Standards Survey (LSS), conducted by *Goskomstat* (the State Statistical Agency) and the World Bank. In addition to

the main household survey on individual and household characteristics, the women's questionnaires were used to collect data from nearly 9,000 female respondents between the ages of 15 to 49 in 2007.

Questions included whether they had ever had an induced abortion, and if so, how many abortions they'd experienced over the course of their lives. The same questions are asked about experiencing miscarriages or still births, and about live births. Figure 5, below, shows the mean count of pregnancies, abortions, and miscarriages in the data.

[Figure 5 about here]

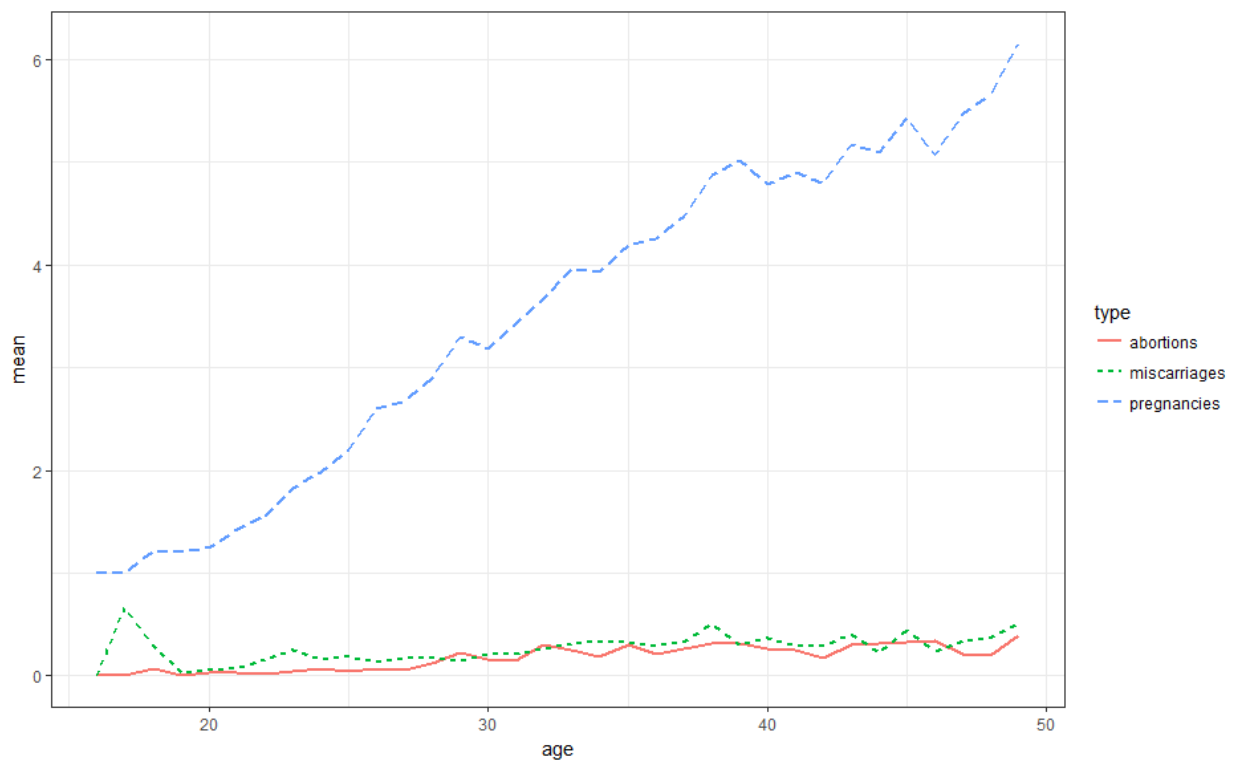


Figure 5. The mean count of pregnancies (dashed), abortions (solid), and miscarriages (dotted) for women in the TLSS

Self-reported survey responses provide more insight into abortions than official data. Official data from the Ministry of Health do not include abortions conducted by private health clinics, self-induced or illegal abortions. However, the questionnaire is retrospective and carries the same limitations as similar survey data. It is very unlikely that women will forget whether they have had an abortion. The LSS does not ask about the timing of these events, and so the recall of the precise timing of the abortion is not a

concern for this study. However, because abortion is a private and sensitive question, women responding to the questionnaire may undercount their abortions, or characterize them as miscarriages or still births. In an innovative survey to examine abortion underreporting among women in Estonia, Anderson et al. (1994) interviewed only women who had recently had a registered abortion in Tallinn. The authors surveyed the women about public health, including questions about recent abortions. They find that indeed some women (about 15%) do conceal their recent abortion experiences from interviewers. However, 93% of the women with recent abortion experiences reported having either an abortion, miscarriage, or still birth. The more ambiguous definition increased reporting accuracy by nearly 10%. Why might this be the case? The authors argue that unmarried women, especially those living at home would be the most likely to mischaracterize their abortion as a miscarriage or still birth. If this were true in the LSS, we might expect to find that the largest increases in reports of abortions, when redefined, would occur among unmarried women and daughters of the head of household.

Table 2. Percentage of women reporting abortions as strictly defined versus those who report abortions, miscarriages, and still births			
	% reported an abortion as defined in LSS questionnaire	% reported an abortion as defined by Anderson et al.	Percent increase
All women	11.1	24.5	121
Unmarried	6.9	13.8	100
Married	11.2	24.5	119
Daughters of household head	10.5	22.3	112
Ethnic Tajik	11	25	127
Ethnic Russian	26.3	34.2	30
Ethnic Uzbek	11.5	22.6	96.5
Rural	8.6	21.9	155
Urban	16.6	29.9	44.5
<i>Source: Tajik Living Standards Survey, 2007. Author's calculations.</i>			

In the case of Tajikistan, the increases in abortion count do not justify the use of the Anderson alternative measure. While Anderson et al. (1994) found only a ten percent improvement in accuracy, the difference between the two definitions creates a 121% increase in reported abortions. This is not altogether plausible. The difference is the largest among rural women – who are also potentially more likely to miscarry because of poor access to healthcare. The smallest differences are among ethnic Russians and the urban population, who have much better access to health facilities in towns and cities and may be more likely to get prenatal care to prevent miscarriages.

Dependent Variables

The data in all models are restricted to the risk set of women who have ever been pregnant, regardless of the outcome (i.e. live birth, still birth, miscarriage, or abortion). I use two dichotomous dependent variables of interest, based on self-reports in the TLSS: *abortions* and *miscarriages*. In this sample, about 11% of women who have ever been pregnant have had at least one abortion. In each model, I use either a control or an offset for the *total number of pregnancies* that a woman has experienced, regardless of the outcome. The total number of pregnancies was constructed by summing the number of live births, still births, miscarriages, and abortions into one continuous variable per woman.

Independent Variables of Interest

I specify *cohorts* based on Shemyakina's (2013) work on marital timing in Tajikistan. These cohorts are important indicators of a woman's position in the life course when war broke out in 1992. Using this approach, I assume that women experiencing similar life course events will act similarly, net of period or age effects. Women who are similar in age and experiencing similar events (such as *perestroika*, the fall of the Soviet Union, conflict) will behave more similarly to each other than women of the same age experiencing different events in different periods of time².

² There are a seemingly infinite number of ways to categorize and measure age. I have specified these cohorts to reflect the patterns in family formation in Tajikistan at the time of the study. In the appendix, I compare different

Age in 1992 (start of conflict)	Age in 1997 (end of conflict)	Age in 2007 (start of survey)	Cohort Label	N	%
30+	35+	45+	Pre-War	770	15
26-29	31-34	41-44	Early-War I	659	12.9
21-25	26-30	36-40	Early-War II	890	17.4
15-20	20-25	30-35	Late-War I	1,083	21.1
12-14	17-19	27-29	Late-War II	549	10.7
Under 12	Under 17	Under 27	Post-War	1,173	22.9

Note: Sample size and percentages calculated using restricted sample of women who have ever been pregnant, consistent with modeling strategy

I combine these individual and household data with *conflict events* from the Uppsala Conflict Data Program’s georeferenced event dataset, drawing on recorded events that occurred in Tajikistan between 1992 and 1997 (Sundberg and Melander 2013). *Conflict events* are topcoded at 20 in order to reduce sensitivity by removing information at the extreme end. Some events are measured at the district level, whereas others are measured at more precise units. For comparability, I aggregate all the events over the five year period to the district level and attach this count of events to each woman who was living in that district in 1992. The distribution of events is clustered around Dushanbe (the capitol), Qurgonteppa, the Rasht Valley, and the more populated areas of the Gorno-Badakhshan Autonomous Oblast. Figure 6 maps the spatial variation of events in the dataset.

[Figure 6 about here]

measures of age, including using linear and polynomial factors, as well as age splines in the models. Although in some cases these models fit the data better, that improvement is not universal across techniques or across the dependent variables. Thus, in this research, I opt for the more intuitive cohort categories.

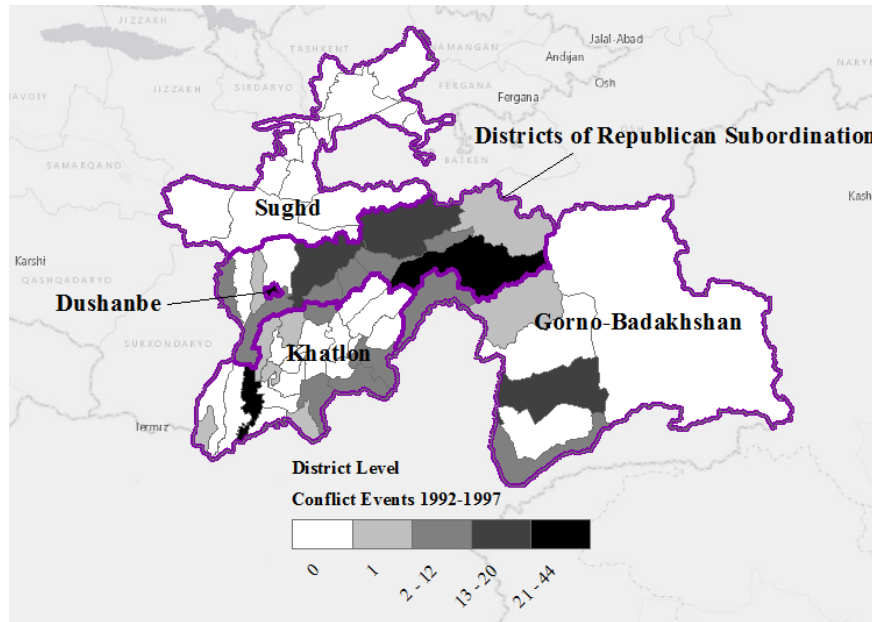


Figure 6. Number of conflict events in the districts of Tajikistan, 1992-1997

Control Variables

A number of factors can influence a woman’s likelihood of inducing abortion or losing a pregnancy. One of the most obvious factors is how many times she has been at-risk, that is, how many *pregnancies* she has experienced, regardless of outcome. Because of the possibility that miscarriages and abortions affect one another³, I also consider whether a woman has also had an *abortion* (dichotomous) in the miscarriage model, and whether she has also had a *miscarriage* (dichotomous) in the abortion model.

Beyond her individual characteristics, community-level features may affect a woman’s reproductive health. Regional differences in Tajikistan are quite salient. The largest administrative units are called *oblasts*. There are five *oblasts* in Tajikistan: Sughd, a fertile valley to the north which borders Uzbekistan and Kyrgyzstan; Khatlon, an arid region to the south that borders Afghanistan, the Regions of Republican Subordination (RRS) surrounding the capitol city, Dushanbe; the autonomous capitol

³ Although there has been research indicating that induced abortions can affect later miscarriages, the findings of this line of inquiry have been controversial and in mixed directions, with some studies showing null results. See (García-Enguádanos et al. 2002) for a concise review.

Dushanbe; and the Gorno-Badakhshan (alt. Kushtoni-Badakhshan) Autonomous Oblast (GBAO) to the east, which contains the Pamir mountain range. I use a categorical variable to control for residence in these *oblasts*.

In addition, whether or not she lives in an *urban* area can affect her ease of access to healthcare institutions. In this sample, as with in Tajikistan as a whole, 70% of respondents live in the countryside. Of the *oblasts* (administrative states), Dushanbe, as an autonomous city, is the only unit without any rural areas.

Two potential control variables were consistently non-significant, and compromised the power of the models when using subsamples. As a result, they are not included in this paper. These variables were the categorical variable for ethnicity, and the variable for educational attainment.

Sample Characteristics

Half the married respondents were the wives of the heads of household, and 45% of the married respondents were daughters-in-law, whereas unmarried women were much more likely to be daughters (82% of unmarried respondents). The median age at first marriage among respondents was 19 years old, with the youngest respondents marrying at 14. The most common age at first marriage is 18 years old (24% of respondents) with nearly 80% of respondents marrying by age 21. Table 4, below, summarizes descriptive statistics for each cohort of women in the LSS sample. As expected, percentages of women currently married and ever pregnant (regardless of the outcome) are much higher in older cohorts. Among the cohort of women who were over 30 at the time of the onset of the war, 98% are married, 98% have been pregnant, and the mean number of pregnancies per woman is 5.5.

As expected, the oldest four cohorts have the highest percentage of women who have ever been pregnant who report ever having aborted. The youngest three cohorts have the highest ratio of abortions per pregnancy. Between half and 60% of women in each cohort were exposed to at least one conflict event in their 1992 district of residence, and among those women, the average number of events in the district is consistently approximately four.

[Table 4 about here]

<i>Table 4. Sample descriptive statistics by cohort specification</i>						
	Pre-War	Early War I	Early War II	Late War I	Late War II	Post-War
Age group in 1992	30 and over	26-29	21-25	15-20	12-14	Under 12
Mean age in 2007	46.8	42.4	38	32.5	27.9	20
% married in 2007	98.4	96.4	96	92.7	79.3	33.8
Mean age at first marriage ^a	20.1	20	20.2	20	20.2	19.4
% ever pregnant	97.8	97.7	94.9	89.8	74.3	27.3
Mean pregnancies per woman ^b	5.5	5	4.7	3.7	2.9	1.7
% ever aborted ^b	13.4	15.2	15.5	12.8	9.3	3.4
Mean abortions per pregnancy ^c	.28	.26	.29	.32	.32	.39
% urban ^b	30	30.3	35.6	33.1	31.6	27.7
% reside in Dushanbe ^b	11.7	14.3	19.1	17	17.5	13.3
% reside in Khatlon ^b	29	24.1	24	26.6	23.4	31.2
% reside in Sughd ^b	26.7	25.6	22.3	24.5	29.6	26.1
% reside in RRS ^b	18.6	21.9	20.8	18.1	20.4	26
% reside in Gorno-Badakhshan ^b	13.9	14.1	13.7	13.7	9.1	3.3
% exposed to at least one conflict event in '92 residence ^b	52	55.1	56.7	55.7	58	56
Mean conflict events in '92 residence ^d	3.8	4.1	4.7	4.0	4.1	4.1
<i>Source: 2007 Tajik Living Standards Survey, author's calculations</i>						
<i>Note:</i>						
<i>^a indicates that values have been calculated with only respondents that have ever been married</i>						
<i>^b indicates that value has been calculated with only respondents that have ever been pregnant</i>						
<i>^c indicates that value has been calculated with only respondents that have ever aborted a pregnancy</i>						
<i>^d indicates that value has been calculated with only respondents exposed to at least one conflict event</i>						

Analytical Strategy

Step One

For both dependent variables, abortion and miscarriage, I estimate a generalized logistic regression model. In the first set of models, I restrict the sample to all women who have ever been pregnant, regardless of the outcome. This is the risk pool for experiencing an abortion or a miscarriage. The reduced sample contains 5,124 observations. Of these observations, 113 respondents reported that they had ever

been pregnant, but did not report the outcome of the pregnancy. Nearly all of these women (108) were in the two youngest cohorts. These observations are removed from the analysis.

Because I use a categorical-continuous interaction term in the full sample, I test the interaction as a whole by comparing fit statistics for those models. For both dependent variables, abortion and miscarriage, the models including the interaction term have lower AICs (for abortions, 2574 vs. 2579 and for miscarriages, 3443 vs. 3455) and thus I accept the interaction over the reduced form model. In the results section, below, I discuss which of the cohorts are likely driving this relationship.

Results

Figure 7, below, shows the predicted probabilities of having at least one abortion for an average respondent⁴ in the full sample. For two of the cohorts, the relationship between conflict and the probability of experiencing an abortion is clearly positive: for those who were ages 15-20 at the onset of the conflict (Late War I), and for those who were 11 and under at the start of the conflict (Post-War cohort). We see a generally negative relationship for the other cohorts, including the Pre-War cohort of women who were over 30 years old at the onset of conflict.

[Figure 7 about here]

⁴ An average respondent here is defined as a woman who has experienced 3 pregnancies, and is living in rural Khatlon oblast.

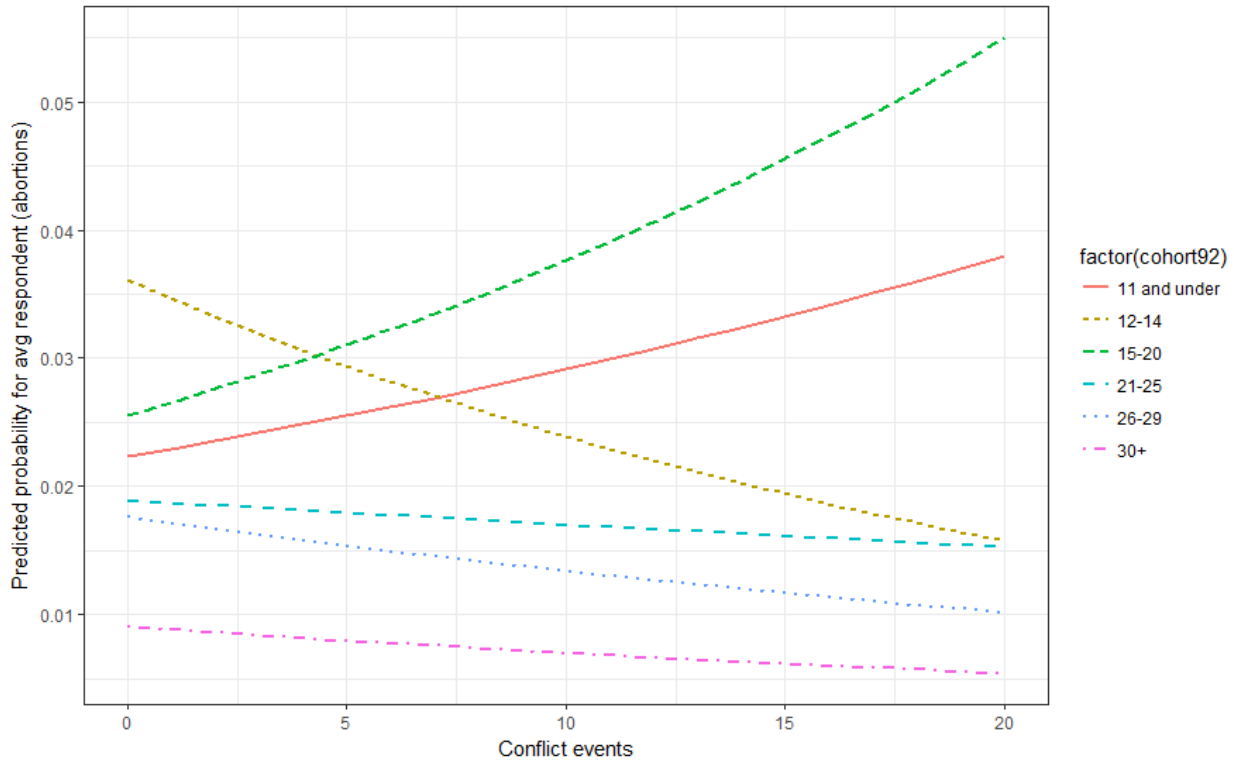


Figure 7: Predicted probability of at least one abortion for the average respondent living in rural Khatlon, who has experienced 3 pregnancies

Coefficients and parameters for this model are presented in Tables 5, below. The major finding from this model is that for women who were 15-20 years old at the onset of the conflict (the *Late War I* cohort, represented by the green line in Figure 7) the relationship between conflict events and likelihood of experiencing an abortion increases differently than every other cohort, except the youngest (*Post-War*). Relative to the reference cohort (*Pre-War*), the effect of conflict events is $\beta = .065$ greater in the *Late War I* cohort (for a slope of $\beta = .039$ when taking into account the non-interacted term for conflict events). In subsequent testing (not shown), I confirm this finding by alternating the reference cohort in five additional model estimations. This finding supports that women at peak childbearing ages have a higher likelihood to abort when exposed to conflict events. This association is in addition to the strong, statistically significant cohort effect in which all cohorts are more likely to induce an abortion than the women in the *Pre-War* cohort who had reached 30 years or older at the onset of conflict (in order, $\beta = .676$, $\beta = .754$, $\beta = 1.06$, $\beta = 1.42$, and $\beta = .920$). These findings suggest that while abortion rates

nationwide are declining, the number of women choosing to induce at least one abortion in her lifetime could be rising.

Regarding the control variables, urban women are more likely to abort ($\beta = 1.08, \alpha < .001$). Women in Sughd and Gorno-Badakhshan oblasts are more likely to abort than their counterparts in Dushanbe ($\beta = .612$ and $\beta = .666$, respectively). Women in Khatlon are marginally statistically significantly less likely to abort than those in Dushanbe ($\beta = -.366, \alpha = .053$), while women in the surrounding area in the Region of Republican Subordination, are not significantly different to those in Dushanbe.

As expected, the total number of pregnancies increases the likelihood of having at least one abortion ($\beta = .602, \alpha < .001$). Somewhat unexpectedly, the odds of having an abortion decrease if the woman has also reported a miscarriage ($\beta = -.494, \alpha < .001$).

Turning to the logistic regression model estimating the likelihood of miscarriage, I find that conflict events are *negatively* associated with miscarriage for those in the Pre-War reference category (see the non-interacted conflict term, $\beta = -.081, \alpha < .001$). Relative to this cohort, there is a very strong positive trend for women in subsequent cohorts. Figure 8 provides compelling illustration of this phenomenon, with each younger cohort experiencing a heightened probability of miscarriage in the absence of conflict (in Table 5, $\beta = .018$, NS; $\beta = .391$, $\beta = .907$, $\beta = .881$, $\beta = 1.43$, respectively), and, with the exception of the *Pre-War* (30+) cohort, showing either a mild or strong positive relationship with the number of conflict events recorded (in Table 5, $\beta = .096$, $\beta = .074$, $\beta = .087$, $\beta = .117$, $\beta = .103$).

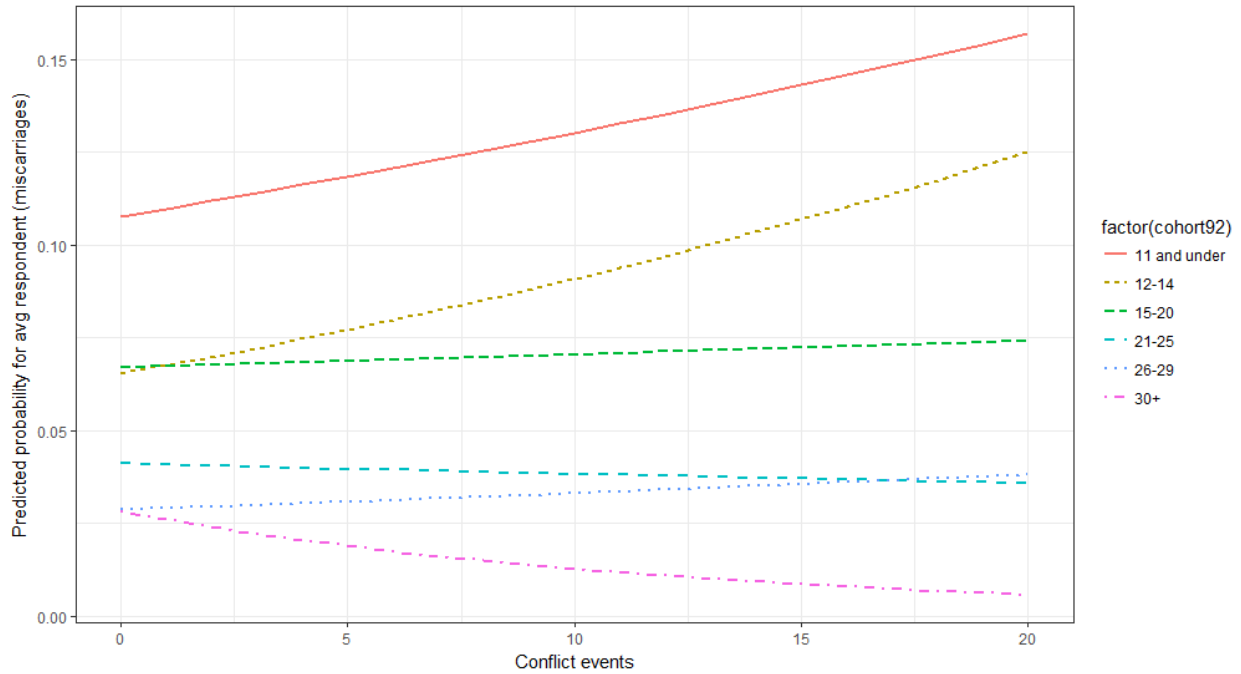


Figure 8. Predicted probability of at least one miscarriage for the average respondent living in rural Khatlon, who has experienced 3 pregnancies

[Table 5 about here]

Table 5. Logistic regression results for all women ever pregnant				
Dependent variable	Ever had an abortion		Ever had a miscarriage	
	Coeff. (SE)	p-value	Coeff. (SE)	p-value
(Intercept)	-6.14* (.315)	< .001	-4.74* (.270)	< .001
Conflict events	-.026 (.022)	.242	-.081* (.023)	< .001
Cohort (ref. Pre-war, 30+ in 1992)				
Early-War I (26-29)	.676* (.207)	.001	.018 (.185)	.923
Early-War II (21-25)	.754* (.201)	< .001	.391* (.173)	.024
Late-War I (15-20)	1.06* (.204)	< .001	.907* (.171)	< .001
Late-War II (12-14)	1.42* (.262)	< .001	.881* (.226)	< .001
Post-War (Under 12)	.920* (.288)	.001	1.43* (.210)	< .001
Conflict events * Cohort (ref. Pre-war, 30+ in 1992)				

Conflict events * Early-War I (26-29)	-.002 (.030)	.942	.096* (.028)	< .001
Conflict events * Early-War II (21-25)	.015 (.026)	.581	.074* (.027)	.005
Conflict events * Late-War I (15-20)	.065* (.026)	.012	.087* (.026)	.001
Conflict events * Late-War II (12-14)	-.017 (.038)	.662	.117* (.030)	< .001
Conflict events * Post-War (Under 12)	.054^ (.031)	.090	.103* (.027)	< .001
Urban residence	1.08* (.134)	< .001	.280* (.124)	.024
Oblast (ref. Dushanbe)				
Sughd	.612* (.184)	< .001	.187 (.169)	.266
Khatlon	-.366^ (.189)	.053	-.154 (.171)	.367
RRS	.292 (.187)	.119	-.154 (.171)	.367
GBO	.666* (.224)	.003	.087 (.205)	.669
Total number of pregnancies	.602* (.031)	< .001	.595* (.028)	< .001
Also had an abortion? (1 = yes)	---	---	-.427* (.129)	.001
Also had a miscarriage? (1 = yes)	-.494* (.135)	< .001	---	---
AIC	2574		3443	
* indicates $\alpha < .05$ ^ indicates $.05 < \alpha < .10$				

Step Two

In the second set of models, I further restrict the sample to women who have ever been pregnant *and* who were under the age of 15 when the war began in 1992. These women were too young at the onset of conflict to make fertility decisions. The results of these models provide insight into the long-term consequences of exposure to armed conflict for abortion. As with the pooled sample, this reduced sample also removes unknown pregnancy outcomes, a deletion of 108 observations, with 1,614 observations remaining. Removing these unknown pregnancy outcomes from the sample did not substantively change the results of this model. It is also necessary to drop the cohort variable due to the nature of the sample restriction. I present the results in Table 6, below.

Conflict events are not statistically significantly associated with the likelihood of having an abortion ($\beta = -.006, \alpha = .797$). However, conflict events are marginally statistically significantly associated with a greater likelihood of experiencing at least one miscarriage ($\beta = .023, \alpha = .099$). These findings suggest that while there is no significant long-term effect of armed conflict on abortions for the cohort of women who were under 15 years old at the onset of war, there does appear to be some relationship (although marginally significant) between conflict and miscarriages among those women.

Turning to the control variables, urban residence continues to be strongly associated with abortion likelihood ($\beta = 1.22, \alpha < .001$) but not for miscarriages ($\beta = .051, \alpha = .843$). Women in GBAO were more likely to induce abortion ($\beta = 1.24, \alpha = .046$) than those in Dushanbe, but the same does not hold for miscarriages. In no other *oblast* do I find statistically significantly different likelihood of abortion or miscarriage.

As expected, the number of pregnancies is positively associated with the likelihood of abortion ($\beta = .930, \alpha < .001$) and miscarriage ($\beta = .646, \alpha < .001$). In neither model was the likelihood of abortion or miscarriage significantly associated with the woman's experience of the other pregnancy outcome.

Table 6. Logistic regression results for women who were under 15 years old at the onset of conflict (Late-War II and Post-War cohorts)

Sample restriction	Women who have ever been pregnant <i>and</i> were under 15 years old in 1992			
Dependent variable	Ever had an abortion		Ever had a miscarriage	
	Coeff. (SE)	p-value	Coeff. (SE)	p-value
(Intercept)	-6.25* (.549)	< .001	-3.71* (.387)	< .001
Conflict events	-.006 (.022)	.797	.023^ (.014)	.099
Urban residence	1.22* (.326)	< .001	.051 (.258)	.843
Oblast (ref. Dushanbe)				
Sughd	.421 (.440)	.338	-.315 (.361)	.383
Khatlon	-.153 (.462)	.740	-.151 (.343)	.660
RRS	.345 (.437)	.429	.041 (.338)	.903

GBAO	1.24* (.620)	.046	-.248 (.530)	.639
Total number of pregnancies	.930* (.093)	< .001	.646* (.067)	< .001
Also had an abortion? (1 = yes)	---	---	-.058 (.313)	.854
Also had a miscarriage? (1 = yes)	-.077 (.337)	.819	---	---
AIC	468		930	

Discussion

Taken together, the findings suggest that for some conflict-affected women, conflict increases the likelihood of having an abortion. For *all* women, conflict appears to affect the likelihood that they will experience at least one miscarriage. However, when we examine the long-term consequences for women who were not at reproductive age at the onset of war, the relationship between conflict and abortion disappears, while the relationship between conflict and miscarriage remains marginally significant.

Why might these results be so different? For women who were younger during the cohort (15 to 20 years old), the likelihood of having an abortion increases with the conflict events in her district of residence at the onset of war. Women in Tajikistan at these ages are preparing to marry and have children. That planning may well have been disrupted by exposure to armed conflict, increasing the likelihood for young women – potentially with spouses killed, disabled, unemployed, or absent from the household – to terminate an unintended pregnancy. This effect disappears when restricting the sample to the youngest cohorts, suggesting that the effect is temporary.

On the other hand, miscarriages are a product of more than individual behavioral response, and may indeed be signals of larger reproductive health *issues*. Issues of inequalities, of public health and safety, and institutional decay can all interact to lead to increased rates of miscarriage. Further, stress and uncertainty have been linked to reproductive health outcomes, even when that stress is experienced *in utero*. For these women who were under age 15 at the start of the conflict, exposure to violence may have

left not only a psychological mark, but also a physiological one that, later in her life course, affects her ability to carry a pregnancy to term.

Limitations

I do not know the date of either pregnancies or abortions for the women in this dataset. For Table 5, this means that I cannot adjudicate between pregnancies or abortions that happened before, during, or after the conflict. Because of the sample selection, however, the results presented in Table 6 are a strong proxy for pregnancies and abortions that happened after conflict. Thus, while the findings in this study are suggestive, future research would benefit from more specific life course data.

Conclusion

Scholars often consider declines in health in Tajikistan as a function primarily of the political transition. This is most certainly a major factor in reproductive health. However, these findings suggest that when indicators of conflict exposure are included in the analysis, a more complex story emerges. Young women on the brink of family formation who are exposed to armed conflict are affected *differently* from their peers who were not exposed. Women in childbearing years during and after the conflict began were more likely to experience miscarriages and this relationship persists for women who had not yet reached childbearing age at the start of the conflict.

Thus, armed conflict affects abortion – for some women at certain stages of the life course. But armed conflict affects miscarriage more broadly, and for longer. These findings contribute to our understanding of armed conflict and abortion and miscarriage. In part, this research contributes an insight into the fertility decision-making process during and after armed conflict, which is tremendously complex. These family planning decisions in the midst of organized violence and institutional change are critical of post-conflict reconstruction, resource distribution, and public health planning. For instance, after war, reconstruction projects that focus on reproductive health – before, during, and after conception – may be the most pressing in conflict-affected areas.

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