Policy Research Working Paper 8927

Unfortunate Moms and Unfortunate Children

Impact of the Nepali Civil War on Women's Stature and Intergenerational Health

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WORLD BANK GROUP
Poverty and Equity Global Practice
June 2019

Abstract

This paper analyzes the long-term health impacts of Nepal's 1996–2006 civil conflict. It exploits the heterogeneity in conflict intensity across villages and birth cohorts to document long-term health and intergenerational impacts. The analysis finds that childhood exposure to conflict and, in particular, exposure starting in infancy, negatively impacts attained adult height. Each additional month of exposure decreases a women's adult height by 1.36 millimeters. The impacts are not limited to first-generation. The analysis also finds that a mother's exposure to conflict in her childhood is detrimental to her child's health. Mothers exposed to conflict during their childhood have more children and live in less wealthy households, likely reducing their ability to invest during their children's critical period of physical development. The finding points to a potential trade-off between the quantity and quality of children. The paper uses information on monthly conflict incidents at the village level, which allows identifying identify the effects of exposure to conflict more accurately than prior studies.

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Unfortunate Moms and Unfortunate Children: Impact of the Nepali Civil War on Women's Stature and Intergenerational Health *

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Keywords: Civil Conflict; Adult Height; Intergenerational Health; Nepal
JEL Classification: I12; J13; O12

*I am grateful for guidance from Benjamin Crost, Richard Akresh, Rebecca Thornton, Hope Michelson, Mary Arends-Kuenning, and Alex Winter-Nelson. Mateus Nogueira Meirelles De Souza and Bhim B. Phadera provided excellent research assistance. I am thankful for comments from Aine McCarthy, Derek Headey, Jennifer Alix-Garcia, the participants of the 16th MWIEDC, and the IFPRI's PHND Brown Bag Seminar.

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1 Introduction

The environmental conditions experienced *in utero* and in early life have profound influence on human biology and long-term health (Golden, 1994; Martorell et al., 1994; Forsdahl, 1977; Barker, 1992; Bateson et al., 2004; Gluckman et al., 2007, 2008). Similarly, early life conditions have lasting and significant impacts on adult economic outcomes (see reviews by Strauss and Thomas, 2008; Currie and Vogl, 2013). These findings are highly relevant in the context of civil conflicts, which cause considerable human suffering, death and property destruction. Despite the potential for conflict to contribute to lasting health impacts, the empirical evidence on long-term and intergenerational effects of conflict on health is limited.[1] Lack of conflict data at detailed geographic scale has made it difficult to measure precisely the consequences of conflicts.

In this paper, I investigate the impacts of early childhood exposure to Nepal's 1996-2006 civil conflict on women's final adult height and on second-generation health using the 2016 Nepal Demographic Health Survey (NDHS) and village-level variation in conflict intensity. By exploiting detailed geographic information on conflict incidents (village-level conflict intensity), I am able to identify the effects of exposure to conflict more accurately than previous research.[2] The literature on the consequences of war, including in Nepal[3] has thus far mostly focused on conflict variation at

[1]Previous studies have documented long-run effects at the cross-country level, suggesting conflicts have large and negative immediate effects on overall economic growth. However, the recovery to equilibrium is rapid (see review by Blattman and Miguel, 2010). Correlated with war exposure, the literature has extensively documented long-run effects of exposures to stress on mental health (Persson and Rossin-Slater, 2018), height and diseases (Bozzoli et al., 2009), birth weight (Camacho, 2008; Quintana-Domeque and Ródenas-Serrano, 2017), and education and socioeconomic status (Almond, 2006). Previous research on conflict has mostly focused on human capital accumulation during or shortly after conflict (Akresh and De Walque, 2008; Bundervoet et al., 2009; Valente, 2014; Akresh et al., 2014; Pivovarova and Swee, 2015). A few recent studies have focused on the long-term impact of conflict on human capital accumulation, with some finding no effect (Miguel and Roland, 2011) and others (Akresh et al., 2012; León, 2012; Justino et al., 2014; Palmer et al., 2016; Akbulut-Yuksel, 2017) finding significant negative impacts. Domingues and Barre (2013) finds that the exposure to Mozambican civil war during childhood had adverse effect on women's adult height-for-age z-score.

[2]A common approach in the literature is to exploit conflict variation at a broader regional level, which has the potential to misclassify one's exposure to conflict and induce measurement errors. For instance, using detailed GPS data on distance between survey villages and conflict sites, Akresh et al. (2014) show that substantial number of households in Eritrea were misclassified as being in non-conflict region in the Akresh et al. (2012) paper that used less precise regional conflict data and there are significant differences in the estimated effects of the Eritrea-Ethiopia conflict between the two measures of the conflict: effects are 87-188% larger using the GPS based measure than the regional based measure of the conflict.

[3]Previous studies of Nepal's civil war are mostly focused on understanding the causes of the war: geographical terrain (Murshed and Gates, 2005; Bohara et al., 2006; Do and Iyer, 2010; Menon and van der Meulen Rodgers, 2015), economic exclusion and poverty (Murshed and Gates, 2005; Onesto, 2005; Do and Iyer, 2010), inequality (Murshed and Gates, 2005; Macours, 2011; Nepal et al., 2011), and lack of political representation (Murshed and Gates, 2005; Bohara et al., 2006; Macours, 2011). The little evidence documenting the consequences of the war, thus far, is focused on district level disaggregation and results are mixed - little to zero impact on human capital accumulation (Valente, 2014; Pivovarova and Swee, 2015), increased miscarriages (Valente, 2015) and positive impact

a broader regional level (see Valente, 2014, 2015; Pivovarova and Swee, 2015; Akresh et al., 2012). Moreover, this study extends the literature on legacies of war by documenting the long-term effect of exposure to conflict on women's final adult height. Along with Akresh et al. (2018), which examines the impacts of the Biafran war using the variation in exposure to the war by ethnicity, this is among the first papers to document the intergenerational transmission of the impact of early childhood conflict exposure on second generation health.

Nepal experienced a decade-long violent civil conflict between 1996 and 2006, which resulted in more than 13,000 fatalities, destroyed considerable infrastructure, hindered delivery of basic services, and generated pervasive and strong feelings of fear, insecurity, and stress among its citizens. I use the Informal Sector Service Center's (INSEC) records of conflict victims to create a casualty-level data set with exact geographical locations (villages) and dates of incidents. I merge the village-level conflict intensity data with the 2016 Nepal Demographic Health Survey (NDHS), which is a nationally representative survey of the female population aged 15 to 49. I limit the analytical sample to women who were either born before or who were *in utero* at the start of the war in February 1996 to assess the lasting impact of conflict on height. In 2016, these women were old enough (20 to 49) to be sampled in the ever-married NDHS 2016 women sample and had documented survey responses about their children that can be used for second-generation analysis. Limiting the sample to women born before the conflict's start date also reduces potential confoundedness through selective fertility and migration (further discussed in empirical strategy section 4). I rely on the biomedical literature that height development in human beings is characterized by rapid growth during the first three years of life, followed by lower level of constant growth and then a secondary growth spurt during adolescence (Figure A.5), and classify women into three treatment cohorts, namely: ages 0 to 3, 4 to 8, and 9 to 15 at the start of the war in February 1996. While women in age cohort 0 to 3 would have been exposed to conflict throughout their entire three stages of growth, the age cohorts 4 to 8 and 9 to 15 would have been exposed only in their latter stages of growth. I define women ages 16 to 21 in 1996 as a comparison group because they would have passed their pubertal ages and attained full adult height by the time of the conflict's start in 1996. I also include women ages 22 to 29 as a

on women's employment (Menon and van der Meulen Rodgers, 2015). Libois (2016), on the other hand, using conflict measurement at more detailed geographical area (distance from the conflict sites) finds significant negative immediate impact on consumption and income. Failure to capture the substantial conflict heterogeneity across villages within district, thus, may explain the little or no impact of conflict at the district level.

second control group to validate parallel-trend dynamics in difference-in-difference specification.

This research makes two primary contributions to the literature on the legacies of war. First, using the variation in exposure to conflict, as measured by months of war, by birth cohort and village of residence, I find that conflict and, in particular, exposure starting in infancy, has a highly significant and negative impact on women's final adult height. Findings are robust across model specifications and measures of conflict. In validating the difference-in-differences estimation strategy used, I find no evidence of presence of non-parallel dynamics nor of selective migration and fertility. These results are important given increasing evidence of the lasting impacts of stunting and slow growth in height early in life on overall physical, biological and cognitive development, school achievement, economic productivity and maternal reproductive outcomes (see review by Dewey and Begum, 2011). Additionally, given the established literature on the existence of a height premium (Persico et al., 2004; Case and Paxson, 2008; Vogl, 2014; Bargain and Zeidan, 2017), these results have important economic importance.

A second contribution: I find that the mothers' exposure to conflict is detrimental for their children's health, especially child weight as measured by weight-for-height, weight-for-age and BMI z-scores. As with the first generation impacts, the second generation results are robust to alternative measures of conflict intensity, including the one where I define a mother's exposure to conflict at her district of birth. I find strong evidence that the women exposed to conflict during childhood have more children and live in poorer households as adults. The combination of these two factors may result in meaningful decreases in parental ability to invest in children. Increased fertility, and, hence, burden of feeding more mouths may negatively affect children's health. However, other unobserved factors such as stress and genomic changes may also influence the intergenerational transmission.

This paper links to three important strands of economics literature. First, the established literature of *in utero* and early life shocks on adult outcomes (see review by Almond and Currie, 2011) and that insufficient or lack of parental investment during critical periods of child development can lead to irreversible damage (Cunha and Heckman, 2007). Second, the paper is related to the literature providing strong positive intergenerational human capital transmission (Currie and Moretti, 2003, 2007; Almond et al., 2012; Justino et al., 2014; Bhalotra and Rawlings, 2013). Third, combining the negative second generation health impacts and finding indicating increased fertility among the first generation point to the Becker and Lewis's (1973) child quality-quantity trade-off hypothesis.[4]

The reminder of the paper is organized as follows. Section 2 provides the background on Nepal's civil conflict, major events that helped shape the war, and the physical and economic costs of the war. Conflict intensity from the INSEC's database and individual data from the 2016 NDHS are discussed in section 3. Section 4 presents empirical strategies for evaluating both the first and second-generation impacts. Empirical results along with identification validation and potential mechanisms for intergenerational transmission are presented in section 5 and concluding remarks are presented in section 6.

2 Background

Nepal is a landlocked country between India and China. Because of its highly mountainous and rugged terrain and lack of adequate infrastructure and economic development, most parts of the country remain remote, and access to basic services remains unattainable to many. With two-thirds of its 30 million inhabitants (estimated as of July 2017) relying on agriculture and a quarter living under the poverty line, Nepal is one of the least developed nations in the world (CIA World Factbook, 2019) and is among the lowest in health, sanitation, primary education and electricity in South Asia.

Figure A.1 shows the administrative divisions of Nepal before the implementation of a new constitution in 2015. The country was divided into five geographically homogeneous development regions, which were further divided to form 75 districts. Districts were further divided into rural (village development committee, VDC) and urban (municipalities) areas, which were the lowest level of administrative units. At the time of the 2011 population census, Nepal consisted of 3,914 VDCs and 58 municipalities (Central Bureau of Statistics, 2012). I calculate conflict intensity at the level of these 3,972 local administrative areas.[5]

[4]Along these lines, Nepal et al. (2018) find that Nepal's civil conflict increased women's desired and actual fertility during the conflict by 22 percent.

[5]For convenience, throughout the paper I refer to these local administrative units as villages although some are technically urban municipalities.

2.1 Conflict in Nepal

For most of modern history, Nepal was governed by absolute monarchs. In the early 1990s several political parties launched pro-democracy street protests, known as the "Jana Andholan" (People's movement), leading to the emergence of multi-party democracy and the introduction of a new constitution. Despite participating in the 1991 legislative democratic elections and winning 9 of the 205 parliamentary seats, the Communist Party of Nepal Maoist (CPN-M) launched an armed struggle, the so-called "People's War", against the state on February 13, 1996 (or in Nepali calendar 2052 Falgun 1 Bikram Sambat). A week before the conflict's start, the CPN Maoist submitted a 40-point memorandum to the government and warned of armed militant struggle if demands were not met. Demands included drafting a new constitution through an election of a constituent assembly; land redistribution; and political equality for all castes, language groups, and women. The government refused to meet the demands of the Maoists. In response, the Maoists attacked an agricultural bank and three police posts in rural western Nepal and formally launched the "People's War".

Over the following decade, the insurgency developed into an entrenched and brutal country-wide civil war. By the end of the insurgency, conflict related killings were recorded in 73 of the 75 Nepalese districts. Figure 1 presents the timeline of the war including major events that shaped the conflict and monthly casualty numbers. As part of the Maoists' strategy, in the early years of the insurgency they launched a guerrilla warfare mostly harassing police forces and garnering support in a few rural areas with communist strongholds (Thapa and Sijapati, 2004). Nepal's remote terrain, under-development, extreme rural poverty, deeply rooted caste and ethnic discrimination, sentiments of political and economic exclusion among rural communities, and lack of government presence in rural areas propelled the Maoists' cause further (Onesto, 2005). The initial inability of the government to recognize the underlying problems that fueled the conflict and to acknowledge the connection between armed conflict and political, economic, and social grievances of the period enabled small communist political elites to mobilize a large base and eventually challenge the government militarily and politically (Kreuttner, 2008).

The year 2001 was a crucial moment for the insurgency. In June 2001, the killing of King Birendra along with most of his immediate family members in a royal massacre shocked the nation.

The King's brother, Gyanendra, was then crowned King. A conspiracy theory emerged centering on Gyanendra's possible involvement in the massacre and questioning the findings of the official investigation further destabilized the country, increasing distrust in the government and the King (Thapa and Sijapati, 2004). A state of emergency was declared in November 2001 and the Royal Nepal Army (RNA) officially became involved in the war after the Maoists walked away from a two-month long ceasefire and attacked an RNA barrack. Thereafter, the conflict intensified and extended geographically. As illustrated in Figure 1, most killings occurred after 2001. However, the insurgency drastically changed its course after King Gyanendra, citing prolonged conflict and growing attacks by the Maoists, dismissed the elected government, placed major political figures under arrest, and assumed direct control over the country in February 2005. Joining the widespread disapproval of the King's actions, the Maoists formed a pact with seven major political parties to present a common front against the monarchy. This eventually led to the signing of a peace accord in November 2006 (or 2063 Mangshir Bikram Sambat), the formation of an interim seven party plus the Maoists coalition government, and an official end to the war. At the time of the signing of the peace agreement, the death toll of the war had reached more than 13,000 (Table 1).

The CPN Maoist's presence across the country over the course of the conflict varied greatly. While the Maoists had a weak presence in urban areas – failing to control even a single city or a district headquarters – they dominated rural Nepal. In October 2003, they declared control over 80% of rural areas (Onesto, 2005) and in many places established fully functional local governments and law courts of their own. They also, however, selectively targeted government forces, attacking army barracks and police posts in urban areas and destroying local government buildings (Do and Iyer, 2010). There were widespread human rights violations and abuses throughout the insurgency by both the government forces and the CPN Maoists (OHCHR, 2012). Physical assault, abduction, and torture of civilians, and looting of individual properties by the Maoists were reported extensively throughout the conflict (Bohara et al., 2006). The security forces, on the other hand, were the major perpetrators of sexual violence, arbitrary arrests and disappearances of civilians and were accused of murder, torture, mutilation, and other cruel and inhumane treatment of civilians to extract information from anyone they deemed appropriate (OHCHR, 2012).

2.2 Consequences of the Civil Conflict and Mechanism

The conflict had widespread impact on economic development and severely hampered delivery of government services. The Maoists' unofficial motto of "Destruction before construction" was very popular among its cadres and was heavily advertised (Nepal, 2004). Maoists destroyed key infrastructure linking urban areas to their rural strongholds and sabotaged public delivery systems. Maoists often targeted rural bridges that linked rural to urban areas and district headquarters, and in many parts of the country, destroyed health posts, drinking water systems, public communication systems, and schools (Jha, 2008). Between 1996 and 2003, physical infrastructure worth at least $250 million was destroyed (Mahat, 2006) and the cost of the conflict was estimated at $66.2 billion (Ra and Singh, 2005).

The conflict in Nepal is likely to have affected adult health and economic outcomes in multiple ways including direct physiological and mental stress, nutritional shocks and reduced access to health care.[6] First, the conflict severely affected the delivery of government services in rural areas; in particular, decreasing health care delivery. Hundreds of community health posts were destroyed; several health care workers were killed; many fled their posts; and cold-chain delivery of vaccines became impossible (Singh, 2004). Second, the conflict likely led to direct physiological and mental stress on residents, especially rural residents. As reported in Table 1, by the end of the conflict, more than 13,000 people had lost their lives, and more than 1,500 people were either disappeared, injured, or disabled. Among the family members of these casualties (estimated between 400,000 and 500,000), many suffered from mental and psychological trauma (Media Foundation, 2011). Third, many lost their sources of income, were displaced, widowed, and many children were orphaned. Fourth, the complete disruption of public delivery systems came as a major shock to nutrition and food security, especially in the northern region that had relied heavily on the government-subsidized rations.

[6] See Akresh et al. (2018) for the discussion of mechanisms through which stress and inadequate resources during civil conflict are likely affect health.

3 Data

One of the major impediments to analysis of conflict is the lack of conflict data at sufficiently granular geographic scale. Most of the literature on the legacies of war therefore is focused on assessing the effects of conflict intensity at relatively high geographical levels. For example, previous studies exploring the determinants of Nepal's civil conflict (Murshed and Gates, 2005; Bohara et al., 2006; Do and Iyer, 2010; Macours, 2011) and the consequences of the conflict (Valente, 2014; Pivovarova and Swee, 2015; Menon and van der Meulen Rodgers, 2015) exploit variation in intensity of the insurgency at district level or even higher geographical units. Defining conflict variables at a broader geographical level measures individuals' exposure to conflict less precisely and can create measurement error. Moreover, significant heterogeneity in geography, socioeconomic status and development among areas within districts can create difficulty in addressing the association between the determinants of war at teh district level and explained variables of interest, likely leading to omitted variable bias.

In contrast, this analysis uses detailed and geographically granular conflict intensity data; i.e. village-level insurgency. As households within a village tend to be highly homogeneous in socioeconomic status and ethnicity and live in the same geographical terrain, this paper is able to avoid many of the concerns induced by the imprecise measurement of individuals' exposure to conflict. Additionally, combining these high-resolution conflict data with the 2016 Nepal Demographic Health Survey (NDHS 2016) allows me to explore the impacts of the conflict on the children of individuals who were exposed to the war in their own childhoods.

3.1 Conflict Data

I use the Informal Sector Service Center's (INSEC) records of the conflict victims to create conflict intensity variables. INSEC is an active Nepalese non-governmental human rights organization. Throughout the war, INSEC documented human rights violations and abuses extensively and its archive of the casualties provides detailed information on each victim's demographic, social and economic characteristics. The database is considered the most reliable data source on casualties of the conflict. Numerous studies including Do and Iyer (2010); Nepal et al. (2011); Valente (2014, 2015) and Libois (2016) have used the database. I extract demographic, educational achievement, social and economic characteristics, and political affiliation of each victim. Most importantly, I extract exact geographical location (village) and the date of the incident.

Table 1 reports descriptive statistics of the war fatalities. In total the INSEC data set contains information on 14,982 victims; most (13,210) are fatal casualties. More than 60% of the casualties are perpetrated by the state. The CPN Maoists deny exploiting the grievances among ethnic groups regarding political, social and economic exclusion to advance their agenda. However, the majority of their cadres belonged to ethnic groups such as Magars, Gurungs, and Dalits of the hills and mountains. It is, therefore, not surprising that the majority of casualties among the Maoists are ethnic minorities (60% not reported) and more than half of the total victims are also from the minority groups. Apart from attacking security forces, the Maoists also frequently targeted upper caste civilians, especially Bramins and Chhetris; these upper castes the Maoists labeled as "counterrevolutionary elements". The average age of the victims is 28.3 years and almost 90% are male. Many were actively involved in politics- 54% are affiliated to either the rebel party or other political parties.

The conflict intensity varied greatly over time. I summarize the number of monthly casualties and major events that helped shape the insurgency in Figure 1. As illustrated, the period after 2001 when the country was under the state of emergency and the RNA was actively involved was the bloodiest. The conflict lasted for total of 131 months from February 1996 to November 2006. Using information on each victim's village and date of incident, I define months of war_v in a village, v, as the baseline conflict intensity variable, constructed as follow:

$$\begin{gathered}\text{conflict}_{v1} = \text{months of war}_v = \sum_{m=1}^{131} \mathbf{1}(\text{casualty}_{vm}) \\ \text{with } \mathbf{1}(\text{casualty}_{vm}) = 1 \text{ if casualty}_{vm} > 0\end{gathered} \tag{1}$$

and subscripts v and m index a village and a month since the beginning of the war i.e. m takes the value of 1 for February 1996 and 131 for November 2006. Variable casualty_{vm} is number of casualties in a village v in a month m.

Villages in Nepal experienced different levels of conflict as illustrated in Figure 2, which depicts the number of months each village experienced conflict out of the total 131 months of the war. The intensity of the conflict varied substantially across villages within districts. Defining the conflict intensity as in Equation (1), however, may create a possibility of under measuring the conflict intensity – for example, a village could be under the siege of the Maoists, reducing access to public services but without any casualties; similarly, one-off destruction of infrastructure could have longer-term ramifications. Unfortunately, we do not have records on infrastructure damages during the conflict. Nonetheless, total months of exposure to conflict and casualty count is used extensively in the literature to measure conflict intensity and assuming classical measurement error, because of the tendency to attenuate towards zero, the estimated coefficients will provide lower bound of the conflict impacts. Additionally, I use several other measures of conflict intensity as below:

$$\text{conflict}_{v2} = \text{number of casualties}_v = \sum_{m=1}^{131} \text{casualty}_{vm} \tag{2}$$

$$\text{conflict}_{vN1} = \text{months of war}_{vN} = \sum_{m=1}^{131} \mathbf{1}(\text{casualty}_{vNm}) \tag{3}$$

$$\text{conflict}_{vN2} = \text{number of casualties}_{vN} = \sum_{m=1}^{131} \text{casualty}_{vNm} \tag{4}$$

$$\text{conflict}_{v50a} = \text{months of war}_{v50} = \sum_{m=1}^{131} \mathbf{1}(\text{casualty}_{v50m}) \tag{5}$$

$$\text{conflict}_{v50b} = \text{number of casualties}_{v50} = \sum_{m=1}^{131} \text{casualty}_{v50m} \tag{6}$$

Conflict intensity based on Equation (2), measure of total casualties in a village over the duration of the war, is illustrated in Figure A.2. Again, the measure exhibits significant variation across villages and the intensity pattern is highly similar to Figure 2. The next four Equations (3) to (6) are defined at higher geographic level with the consideration for potential spatial spillovers – conflict in nearby villages may induce stress, limit one's access to health care or other services. While Equations (3) to (4) are months of war and casualty counts, respectively, in a village including in its contiguous neighboring villages (N), Equations (5) to (6) report months of war and casualty count in a village including the villages around 50-kilometer radius from the center of the village.

3.2 Individual Data

I also use the 2016 Nepal Demographic Health Survey (NDHS 2016) in the analysis. The survey was implemented by New ERA under the aegis of the Ministry of Health of Nepal and was funded by the United States Agency for International Development (USAID). The data collection took place between June 19, 2016 and January 31, 2017.

The NDHS 2016 is a nationally representative survey of the female population ages 15 to 49. The sampling frame for the survey was based on the updated version of the 2011 Nepal Population Census. After the implementation of the 2015 constitution, based on the population several VDCs and Municipalities within districts were merged to form rural development areas and urban areas. The old Village Development Committees (VDC) in the rural and enumeration areas (EAs) in urban places essentially form primary sampling units (PSU) for the 2016 NDHS. In the final sample, 383 clusters or PSUs were selected with probability proportional to their population size (see Ministry of Health, 2017). Figure A.3 illustrates the coverage of the survey. All 75 districts except Manang and Mustang were sampled; however, these two districts also had zero casualties during the conflict and are excluded from the baseline analysis. As illustrated in Figure 3 (months of war) and Figure A.4 (casualty count), conflict intensity varied significantly across the 383 NDHS villages (clusters).

Within the selected DHS clusters, 30 randomly selected households were interviewed, and all women aged 15 to 49 who were permanent residents or visitors who stayed in the household the night before were eligible for the interview. A sub-sample of about half of the households were selected for biomarker information. All children aged 0 to 59 months and women 15 to 49 years in these households were administered the anthropometry, hemoglobin, and blood pressure measurements. I limit the analytical sample to those that are born before or were *in utero* during the start of the conflict in February 1996 so that they are old enough to be sampled in the ever-married NDHS 2016 women sample and have children that can be incorporated in the second-generation analysis. The final analytical sample size is 4,421 women ages 20 to 49 at the time of the survey (0 to 29 at the start of the conflict) and their 2,168 under age 5 children.

Table 2 summarizes women's health outcomes and their exposure to conflict and demographic characteristics. I divide women into two cohorts: ages 0 to 15 (treatment) and 16 to 29 (control) at the time of the start of the conflict. While the women in the former cohort would have still been in a period of physical growth during the conflict years, the latter cohort would have already gained full adult height (detail discussion is presented in empirical strategy section 4). On average, women in the sample are 151.6 centimeters tall, with the younger treated cohort 0.46 cm taller on average. Similarly, compared to the control cohort, treated cohorts are less likely to have had any incidence of pregnancy loss, report having had fewer live births, were slightly younger at first birth, attained more years of education, and were less likely to be employed at the time of the survey. However, there is no difference in economic status (wealth index) between the two groups.

By construction, the older cohort faced zero level of conflict during the first 15 years of life (Panel B.1). Balance in lifetime exposure to conflict between the two sets of women (Panel B.2) is reassuring for the empirical strategy used in section 4, which implies that the two groups do not come from different types of sampled clusters. On average, women are 33.4 years old with treatment and control cohorts being 27.9 and 41.8 years old respectively (Panel C). Women in treatment groups are more likely to live in a household with a female head, are more likely to be of lower caste, and are less likely to be from Eastern Development region. All other controls are balanced between the groups.

Summary statistics of the children sample is presented in Table 3. Children are divided into treated and control group by their mother's age at the start of the conflict. 47% of the children are girls and on average tend to be the second child (Panel C). There is no difference in control variables (Panel C) and health outcome variables between the two groups except treated children are slightly taller. Panel B reports mother's exposure to conflict. Again, it is reassuring that there is no disparity in their mothers' lifetime conflict experience.

4 Empirical Strategy

Women surveyed in the NDHS 2016 experienced different levels of exposure to conflict intensity according to their village of residence and year of birth. The identification strategy exploits this variation, specifically, the variation in exposure to the conflict during the individual's critical period of physical growth.

Height development in humans is characterized by three distinct stages. There is a rapid growth during the first three years of life, followed by a lower level of constant gain in height until the start of adolescence and then a second growth spurt during adolescence ending in gaining full adult height (Tanner et al., 1966a,b; Beard and Blaser, 2002; Bozzola and Meazza, 2012). Figure A.5 demonstrates height velocity curves for a typical boy and a typical girl. Under adequate nutritional and environmental conditions, the height growth rate is highest during infancy, 26 centimeters per year, and progressively declines until around age three, then stabilizes around 6 centimeters per year until the start of puberty (Beard and Blaser, 2002; Bozzola and Meazza, 2012). Pubertal height spurt among girls starts after age nine, peaks at about 12 years, and stops around the age of 15 (Figure A.5).

I borrow these stylized facts from the clinical and bio-medical literature to establish causality. NDHS collects individuals' month and year of birth, which I use to create the age of women at the start of the conflict in February 1996. Figure 4 presents cohorts by age at the start of the conflict and potential exposure to conflict at different stages of their physical growing periods. As demonstrated in Figure A.5, girls past their pubertal age i.e. cohorts aged 16 to 21 and 21 to 29 in 1996 (control 1 and 2 respectively) would have gained full adult stature by the time of the start of the conflict, and the effect of the conflict should be minimal or zero on their final height. I use cohort 16 to 21 as the main comparison group and use cohort 22 to 29 as a control placebo experiment in a difference-in-difference specification. Based on their growing phases at the beginning of the conflict, I create three conflict-exposed cohorts. Although in the important phase of adolescence height spurt, girls aged 9 to 15 (treatment 3) would have faced conflict only in their third phase of height growth. While girls aged 4 to 8 (treatment 2) would have been exposed to conflict in the second and third stages of growth, cohort 0 to 3 (treatment 1) would have been exposed to conflict through the entire growing period (all three stages).[7] In the baseline specification, I define conflict intensity at the village level, hence, all five cohorts from any given village would have been exposed to the same total amount of conflict during their lifetimes. However, the exposure would have started at different times of their lives.

[7]These five cohorts aged 0 to 3, 4 to 8, 9 to 15, 16 to 21, and 22 to 29 at the start of the conflict in 1996 would become 20 to 23, 24 to 28, 29 to 35, 36 to 41, and 42 to 49 at the time of the NDHS 2016 survey.

4.1 First Generation Impact

To explore the impact of early childhood exposure to conflict on adult outcome, I employ the following estimation strategy:

$$\begin{aligned} Y_{imntcvdr} = & \beta_c(\text{conflict}_v \times \lambda_c) + \text{conflict}_v + \lambda_c + \alpha_t + \eta_m \\ & \delta_v + \gamma_r^T + X_i + \omega_n + \varepsilon_{imntcvdr} \end{aligned} \tag{7}$$

where Y is an outcome of a woman i born in month m and year t, interviewed in month n, and residing in village v, district d and development region r. While women's adult stature is the main outcome of interest, I also explore conflict's impact on women's reproductive health, sexual behavior, educational attainment, employment, and wealth. The independent variable of interest, $\text{conflict}_v \times \lambda_c$, is constructed as a vector of age-cohort specific coefficients. The baseline conflict intensity variable is months of war in a village; however, I also estimate the same equation using all the other conflict variables defined in the data section. Equation (7) also includes the main conflict variable, conflict_v, and cohort fixed effects, λ_c, as part of the independent variables. While α_t are year of birth fixed-effects, η_m are month of birth fixed effects added to control for any seasonality - whether women were born in peak or lean season. While δ_v are village (NDHS cluster) fixed effects, ε is a random, idiosyncratic error term.[8] Equation (7) also includes five development-region-specific trends, γ_r^T, to isolate variance in a cohort's outcome in deviation from the long-run trend in her development region of residence. The five development regions were relatively homogeneous in terms of development, geographical terrain and ethnic composition before the war.

The socioeconomic status of the household is likely to play a significant role in child development and would be desirable to control for in the regression. Albeit observed 10 years after the end of the civil war during the time of the survey, household characteristics may still be influenced by the conflict. X_i, therefore, includes only variables that are time-invariant. Contrary to the Maoists' denial, ethnicity played an important role in the insurgency. X_i, therefore, includes indicators for belonging to a high caste. In addition, month of the survey interview fixed effects, ω_n, are included in the regressions to control for the variation in seasonality due to the timing of the survey.

β_cs in Equation (7) are the main coefficients of interest. Under a standard difference-in differences

[8] I also estimate equation 6 using district fixed effects instead and the results are robust. All the standard errors are clustered at the village level to allow for the correlation among error terms within village.

model assumption and, in particular, under the assumption that there is no correlation between village level conflict and unobserved factors varying with village and birth year cohort within the development region, β_c coefficients indicate the causal impact of early childhood exposure to civil conflict on adult stature. While interpreting the results, given the set of fixed effects in Equation (7), β_c do not identify the effects at a national level. Rather effects are identified due to women's exposure to conflict by village of residence and birth year cohort net of birth year trends common to all the villages within the development region. The goal of the paper is to measure the total effect of the conflict on one's life and specification 7 does exactly that. Rather than measuring the impact of exposure to conflict at a specific period of one's life, it measures the cumulative impact of exposure during one's entire growth period.[9]

Studies exploring the determinants of the Nepal's civil conflict have advanced several arguments regarding the insurgency heterogeneity across Nepal including geographical terrain (Murshed and Gates, 2005; Bohara et al., 2006; Do and Iyer, 2010; Menon and van der Meulen Rodgers, 2015) economic exclusion and poverty (Murshed and Gates, 2005; Do and Iyer, 2010), inequality (Macours, 2011; Nepal et al., 2011), and lack of political representation (Murshed and Gates, 2005; Bohara et al., 2006; Macours, 2011). These determinants of variation in insurgency intensity are, therefore, likely to be correlated with the outcomes of interest, threatening the validity of the identification. However, all these studies have focused on the determinants of the conflict at the district level. Therefore, the application to village level conflict are at most minimal because unlike districts, villages in Nepal are highly homogeneous in terms of ethnic composition, socioeconomic status, and geography. A major advantage over previous studies of the conflict is that this paper uses a detailed geographical level conflict intensity allowing for the inclusion of village-level fixed-effects, which eliminates any village-level time-invariant factors. The timing of the beginning of the conflict in women's lives within a village therefore forms the comparison divide in the estimation strategy.

[9] A typical approach in the literature is to measure conflict based on one's exposure at specific age and use fixed effects models to identify ages or age-periods during which the exposure was most critical as below:

$$\begin{aligned} Y_{imntvdr} = &\beta_0 + \beta_1 \times \text{Exposure during 0 to 3 years} + \beta_2 \times \text{Exposure during 4 to 8 years} + \\ &\beta_3 \times \text{Exposure during 9 to 15 years} + \alpha_t + \eta_m + \delta_v + \gamma_r^T + X_i + \omega_n + \varepsilon_{imntvdr} \end{aligned}$$

Conflict variables are defined as woman's exposure to conflict during her age of 0 to 3, 4 to 8 and 9 to 15 years and all other variables have the same meanings as in Equation (7). The results are presented in Tables A.1 to A.2. While important in identifying what part of one's life was important, the specification does not identify the overall impact of the conflict.

Selective fertility and endogenous migration are other major concerns regarding the identification strategy. As discussed in the data section, I limit the analytical sample to those who were already born or *in utero* during the start of the conflict in 1996. Purely on identification prospective, it helps limit the potential confoundedness between the explained variables of interest and selective fertility and migration. For instance, the strategy helps mitigate the scenario in which after grasping the seriousness of the war, couples that are highly concerned about their children's health in high conflict areas may choose to delay having children or migrate to low conflict areas to start a family. However, it could be true for the periods prior to the start of the conflict that in anticipation of the war concerned couples may have delayed having children or may have migrated. Detailed robustness checks are presented in the empirical results section.

4.2 Intergenerational Health Impacts

The gap between the start of the Nepal's civil conflict and the time of the NDHS 2016 survey is sufficient enough that I can explore the impacts the conflict had on the children of women who were exposed to the war in their childhood. Anthropometric measures were collected for children under the age of 5 at the time of the survey and hence I limit the second-generation sample to children under 5 in 2016. I employ the same strategy as in Equation (7) and add child specific controls to estimate. Following is the estimation equation:

$$\begin{aligned} Y_{jklnimtcvdr} = & \beta_c(\text{mother's conflict exposure}_v \times \text{mother's cohort}(\lambda_c)) \\ & + \text{mother's conflict exposure}_v + \lambda_c + \alpha_t + \eta_m + \delta_v \\ & + \gamma_r^T + + X_i + \mu_k + \theta_l + \pi_n + X_j + \varepsilon_{jklnimtcvdr} \end{aligned} \tag{8}$$

where Y is a health outcome of a child j whose anthropometrics were measured in month n, was born in month k and year l to a woman i who was born in month m and year t, and resides in village v, district d and development region r. Child health endowment is defined as function of all mother's controls and exposure to war as defined in section 4.1 and child specific characteristics. θ_l are child's birth-year fixed effects. As with mothers, child month of birth fixed effects, μ_k, are included to account for season of birth. Similarly, child anthropometric measures are sensitive to the timing of the measurement; in particular child weight, hence, Equation (8) also includes month of measurement fixed effects, π_n. ε is a random, idiosyncratic error term and all the standard errors are clustered at the village level to allow for correlation among error terms within villages. X_j is a vector of time-invariant child controls – dummy variables equal to one if the child is a girl and if the child is a twin and child birth order fixed effects. As in Equation (7), β_cs are the coefficients of interest and have the same meaning as in Equation (7) but identify to the impact of mother's childhood exposure to conflict on her child's outcomes. The equation under the standard assumptions of difference-in-differences models provides estimates of the causal impact of conflict on second-generation health.

5 Results

In this section, first I present the impact of childhood exposure on adult stature and establish validity for the identification strategy. Second, I report impact on health and economic outcomes that are very important to women's well-being, but also provide additional explanation for the impact on second-generation health. Finally, I present the health impacts on the children of women who were exposed to the war in their childhoods.

5.1 Impact on Women's Stature

Table 4 presents the impact of early childhood exposure to conflict on adult stature using difference-in-differences Equation (7). The conflict intensity variable used is months of war in the village of residence. While the outcome variable, height, in columns 1 to 3 is measured in centimeters, columns 4 to 6 present height-for-age standard deviation (HAZ). The possibility of "non-parallel dynamics" in the difference-in-differences estimation could be problematic. Because of difference in overall trends (health, education, poverty, environmental etc.), changes in adult stature could vary systematically across villages and, in particular, there could be mean reversion. Given the data structure, I can, however, test for the identification assumption. Besides the control group (aged 16 to 21 in 1996), women in age cohort 22 to 29 in 1996 would have gained full adult height by the start of the conflict, hence, the changes in adult height between these two cohorts should not differ systematically across villages. Age cohort 22 to 29 is therefore included in all the regressions as a control to validate the identification assumption.

Village fixed effects are included in all specifications. I start estimation with no additional controls (column 1) and progressively include extra controls. Column 3 is the full baseline specification. The estimated differences-in-differences for cohort 22 to 29 are close to 0 in size and statistically not different from 0 across all specifications and measures of height. This provides strong evidence that the difference-in-differences coefficients of interests are not driven by inappropriate identification assumptions.

Exposure to civil conflict only during the pubertal spurt appears to have no significant effect on adult height. Across all specifications, conflict had statistically zero impact on height of the women aged 9 to 15 in 1996 compared to women in the control group. On the surface, this finding is slightly at odds with Akresh et al.'s (2018) analysis of Biafran war, where they find conflict intensity during women's adolescent years to have significantly negative impact on their adult stature. However, as illustrated in Figure 1, Nepal's conflict started as a small-scale rebellion and only after 2001 developed into countrywide brutal civil war. Unlike the other two treatment cohorts in the paper, most women in this age group would have escaped the most brutal phase of the civil conflict during their growing period. In addition, my identification strategy differs from Akresh et al.'s (2018) in that women in this age group start facing conflict only during their adolescent years.

Women aged 4 to 8 in 1996, on the other hand, would have just entered or already be in their adolescent spurt years when the conflict started to intensify in 2001.Therefore, it is not surprising to see the cumulative violence, which was at a lower level in the second growth stage and intense in the third stage, has significant and negative impact on their adult stature. Effects vary between 0.67 to 0.71 millimeters (0.011 to 0.012 sd) across the specifications. The coefficient in the full model can be interpreted as: an additional month of exposure to civil war during the latter two stages of the growing period decreases final adult height by 0.71 millimeters or 0.012 sd.

Besides being a period of a rapid growth, the first three years are also the most sensitive period to environmental influences on height in human beings (Schmidt et al., 1995). Early childhood height at ages 2 (Luo and Karlberg, 2000) and 5 (Satyanarayana et al., 1986), is a strong predictor of final adult height. Similarly, the pubertal growth spurt plays an important role in determining the final adult stature (Case and Paxson, 2008). Women in the age group 0 to 3 in February 1996, who would have been exposed to conflict during all three phases of growth, therefore would suffer the most from the conflict compared to the other age groups. On average, girls aged 0 to 3 in 1996 suffered a reduction in adult height of 1.36 millimeters or 0.023 standard deviations due to an additional month of exposure to conflict during their entire period of physical development (Columns 3 and 6). The effect size is twice as big as the effect on the cohort aged 4 to 8 (0.071mm and 0.012 sd) that experienced same level of violence but only after the age of 3, hence signifying the importance of environmental influences on height during the first three years. The result is highly significant and robust across all specifications and for both measures of height ranging from 1.22 to 1.36 mm and 0.021 to 0.023 sd reduction in adult height.

Figure 5 presents the impact of exposure to conflict starting at different ages using the baseline specification. Again, conflict exposure in first 8 years of life reduce adult height, however, ages 0 to 3 are the only ages that are statistically significant. As discussed in the data section, I define the conflict intensity variable multiple ways and results using the baseline specification are presented in Table 5. Conflict intensity used in column 1 is the number of casualties in one's own village of residence. Consistent with the earlier findings, among women who were aged 0 to 3 and 4 to 8 in 1996, increased casualties in the village of residence significantly decreased their final adult stature. In columns 3, 4 and 5, I define war intensity as months of war including the contiguous neighboring villages and within a 50-kilometer radius from the village center. Again, the results are robust, especially among age cohort 0 to 3.

Height has long been recognized as an important factor influencing individuals' professional and personal success. Results presented in this section, thus, have important economic significance. Taller workers receive a wage premium. An additional inch of height is associated with 1 to 3 percentage increase in earning among the British and American adults (Persico et al., 2004; Case and Paxson, 2008). There is even greater height premium in lower income settings: an additional centimeter of height is associated with a 2 percent increase in hourly earnings both in Mexico (Vogl, 2014) and Indonesia (Bargain and Zeidan, 2017). Using the results from Indonesia and Mexico, a quick back-of-the-envelope calculation implies that an additional month of conflict exposure starting at infancy is associated with a decrease in hourly earnings of 0.27 percent.

5.2 Identification Validation

In this section, I present additional evidence in support of the estimation strategy. In addition to the possible presence of non-parallel dynamics discussed in the earlier subsection, selective migration and fertility are other major threats to the identification strategy. The conflict intensity variable is defined at the level of an individual's village of residence at the time of the survey. Systematic sorting by economic and physical status between the stayers at high conflict villages and movers from the high conflict to low conflict villages is of concern, which will lead to overestimation of the impact of conflict. Unfortunately, I do not observe women's village of birth. However, the 2016 NDHS asked each individual how long she has been residing at the place where she was surveyed and if not her entire life, the name of the district from which she migrated. Twenty-six percent of the women in the sample are living in a different district. Although the survey did not collect the information, marriage is the most likely reason for women's migration, as most women in Nepal move to their husband's home permanently from their maternal home, which is also likely to be their place of birth.

I define conflict at the level of women's districts of birth (district they moved from) and estimate the same specification as Equation (7) except with district of birth fixed effects and region of birth trends and present the results in Table 6. Columns 1 to 3 examine the presences of differences in migration patterns between the control and treated cohorts. The difference-in-differences across the specifications are zero, suggesting no selective migration. Columns 4 to 9 re-estimate the main results from Table 4. The differences-in-differences estimates, although reduced in magnitude, are statistically significant and in the same direction as in the main specification for age cohort 0 to 3. Villages within district are highly diverse and defining conflict at the district level takes away that variation. Additionally, I limit the sample to women living in the village where they were surveyed their entire life and estimate Equation (7). The results are presented in Table A.3. The effect sizes are comparable to the baseline results in Table 4. These results, overall, suggest there is minimal or no selective migration among the women in the sample.

Limiting the sample to women already born at the start of the conflict limits the scope for confoundedness through selective fertility. However, prior to the start of the conflict couples that were highly concerned about their children's health may have delayed having children in anticipation of the war. If true, we expect to see significantly different level of births between high and low conflict areas periods just before the start of the war. However, the conflict lasted for a decade and concerned couples may have had to wait for the full decade to have a child – a highly unlikely scenario. To formally examine this issue, I use the information on district of birth and year of birth from every individual observed during the 2001 Nepal Population Census and calculate yearly district birth rates. As reported in Figure 6, there is no difference in birth rates between the districts experiencing above and below the median conflict intensity (months of war). Table A.4 reports regression results for the same test and we see no difference in periods long before and just before the start of the conflict.

5.3 Impact on Fertility, Education, Employment and Wealth

Estimates in Table 7 show the impact of conflict on reproductive health and fertility using the baseline specification. Early childhood exposure to conflict has no significant impact on probability of miscarriage or of stillbirth among women in age cohorts 9 to 15 and 4 to 8 in 1996. Women experiencing conflict during their entire growth period, however, are significantly more like to have had a stillbirth or miscarriage: each additional month of conflict exposure increases the risk of stillbirth by 0.03 and of miscarriage by 0.06 percentage respectively. Valente (2015) finds similar results that pregnancies that were exposed to Nepal's conflict were more likely to result in a miscarriage. There is no significant impact on the probability of abortion. Women exposed to conflict during their early growing periods have significantly more live births, 0.024 and 0.013 more births per month of exposure among cohorts aged 0 to 3 and 4 to 8 in 1996 respectively. The impact of conflict on the number of infant deaths is zero (column 5).

Impacts of early childhood exposure to conflict on other fertility outcomes are presented in Table 8. The conflict has statistically no impact on the likeliness of contraceptive use (column 1), number of women's sex partners, age at first sexual intercourse and age at first birth. There are also no significant differences between women in control and treatment groups on their age at first cohabitation with their domestic partner and number of marriages and unions. Additionally, there is no difference in the smoking or chewing tobacco habits of women in treatment groups and control group.

Table 9 shows impact on women's human capital accumulation, employment and wealth. While there is no significant impact on years of education, women in age cohort 0 to 3 are significantly less likely to have completed a school leaving certificate (SLC). The lack of results in years of schooling are consistent with Valente (2014) and Pivovarova and Swee (2015). Both examine the conflict's impact on human capital accumulation. Similarly, there is no impact on the probability of being employed. However, women exposed to conflict are significantly more likely be employed in agricultural sector. As a measure of a household's cumulative living standard, the DHS reports a wealth index using ownership of easy to collect assets, materials used in housing construction, and access to type of water and sanitation facilities (see Rutstein and Johnson, 2004). Women exposed to conflict early in their childhood are likely to live in households with poorer living conditions (column 7). The wealth factor score is lower by 977 and 675 per additional month of exposure to conflict among women aged 0 to 3 and ages 4 to 8 in 1996 respectively. In addition to providing information on women's adult living conditions, outcomes discussed in this subsection provide a window to what types of households the children of individuals exposed to conflict in early childhood are living in. Therefore, these effects are likely to provide explanations for the second-generation health impacts presented in the next subsection.

5.4 Impact on Intergenerational Health

The intergenerational impacts of conflict on health are presented in Table 10. As discussed in section 4.2, the estimation strategy used is the same as for the first generation, except I add child-specific controls. The sample consists of children under the age 5 whose anthropometrics were measured. I also include children born to women aged 22 to 29 in 1996 to provide support for the identification validation required by difference-in-differences assumptions. The falsification test supports that identification strategy, as estimates for all outcomes for children born to the experimental control cohort of mothers are statistically zero.

Although statistically imprecise, mothers' exposures to conflict negatively affects child's height (column 1: table 10). Children born to women in all the three treatment groups are shorter by 0.005 to 0.011 standard deviations for their age. Child development in terms of weight gain is significantly hampered by mother's exposure to conflict in her childhood. Compared to children born to the control cohort of mothers, an additional month of mother's exposure to conflict during her entire growth period decreases her child's weight for height z-scores by 0.030 standard deviations (5.2 percent less than control mean). Exposure to conflict starting at older age is even more severe for second-generation weight for height. Women in cohorts age 4 to 8 and 9 to 15 in 1996 have children 0.039 and 0.041 standard deviations lighter for their height (6.7 and 7.1 percent less than the control mean). All the coefficients are estimated precisely. Column 3 reports the conflict's impact on second-generation weight-for-age. Mother's exposure during her childhood, again, has significant negative impact on child weight-for-age, especially among children born to women in the cohort aged 9 to 15 in 1996. Additionally, maternal war exposure is strongly associated with significant lower body mass of children (column 4). As with the weight-for-height, the impact size is increasing with the age at which the mother started experiencing war. Compared to the control, mothers exposed in all three stages, the latter two stages, and the final adolescence stage (aged 0 to 3, 4 to 8, and 9 to 15 at the start of conflict), have children with lower BMI by 0.031, 0.040, and 0.044 standard deviations respectively. Alternatively, an extra month of exposure led to a decrease in children's BMI by 0.030 to 0.044 standard deviations. These results are consistent with Akresh et al. (2018), in that the adolescent exposure to conflict has strongest impacts on second-generation health. Table A.5 presents the same results using other conflict measures discussed in section 3 and the results are robust across all conflict definitions.

As a robustness check, Table 11 presents the intergenerational impact using conflict intensity based on mother's district of birth. The estimate shows stronger results than when defining maternal exposure to conflict at the level of village of residence. Compared to the children of women in the control group, weight-for-height z-scores are significantly less among children of women in the treatment group. The impact size between the treatment groups are highly comparable. Similarly, impacts on weight for age and BMI have similar strong negative impacts. These coefficients are smaller than those reported in table 11 but are more precisely estimated. In both the specifications, we observe negative but statistically zero impact on child height. However, at this stage of physical growth, children may be too young to develop stunting and negative impacts on weight measurements provide strong indication for future stunting.

Channels for intergenerational transmission of maternal exposure to conflict to child may vary greatly. In addition to unobserved factors such as the physiological stress and genomic changes, the intergenerational transmission may be working through the maternal health, education or wealth endowment or through early childhood investment (Cunha and Heckman, 2007). Results presented in section 5.3 are likely to explain some of these channels. Nepalese women exposed to conflict during their childhood development are more likely to have had pregnancy losses and at the same time have more live births (Table 7). Although I find no evidence for sexual behavioral changes (Table 8), women are less likely to have completed SLC, and most work on their own farms (Table 9).

Additionally, highly significant in terms of parental ability to invest in children, exposed women have significantly less wealth. Combined with having more children, this drastically decreases parents' ability to invest in children during their critical period of development.

6 Concluding Remarks

This paper exploits variation in conflict at a detailed geographical level to establish causality between early childhood exposure to conflict and women's final stature. Additionally, along with Akresh et al. (2018), this paper is among the first to document the intergenerational transmission of the impact of early childhood conflict exposure on second generation health. Nepal experienced a decade-long violent civil conflict between 1996 and 2006, which resulted in more than 13,000 fatal casualties, significant infrastructure damages, and severe hindrance in delivery of basic services and generated extreme fear, sense of insecurity and stress among its citizens. Considered the most reliable, I use INSEC's database on the conflict casualties and create an individual level victims' data set with exact geographical location (village) and dates of the incidents. This allows me to exploit variation in conflict intensity at the village level for identification.

Fueled by international remittances, Nepal enjoyed consistent economic growth and poverty reduction (Uematsu et al., 2016) during the period of conflict. The country also made significant improvement in other dimensions of development including health (Headey and Hoddinott, 2015) and non-income based multidimensional poverty (OPHI, 2013). These aggregate development trends, however, may mask disparities at a more disaggregated level due to significant variation in conflict intensity. The little research documenting the consequences of the war thus far is focused on district-level disaggregation, and results are mixed - little to zero impact on human capital accumulation (Valente, 2014; Pivovarova and Swee, 2015) and positive impact on women's employment (Menon and van der Meulen Rodgers, 2015). Libois (2016), on the other hand, using conflict measurement at a more detailed geographical level (distance from the conflict sites) finds significant negative immediate impact on consumption and income. Failure to capture the substantial conflict heterogeneity across villages within district may explain the lack of evidence of conflict effects at the district level.

In contrast, I exploit variation in early childhood exposure to conflict by birth cohort and village of residence to estimate the impact of conflict intensity, as measured by months of war, on adult height. Using the 2016 NDHS women sample, I find that conflict and, in particular, exposure starting very early in one's growing period, has highly significant and negative impact on women's final adult height. Findings are robust across (i) model specifications and (ii) measures of conflict. In validating the difference-in-differences estimation strategy used, I find no evidence of presence of non-parallel dynamics nor of selective migration and fertility. These results are aligned with the biomedical literature that early childhood conditions are highly significant in determining final height – early life stunting increases the risk of being short as an adult (Golden, 1994; Martorell et al., 1994). Conditions in the fetal period and early years after birth are profound in influencing human biology and long-term health. Responses to lack of adequate nutrition of developing fetus may be coded permanently, which is likely to increase later life health hazards (Barker, 1992). Similarly, early years of life are highly susceptible to environmental influence on height (Schmidt et al., 1995). Nepalese children growing up during the conflict experienced substantial levels of physiological and mental stress, and for many, mostly in rural areas under the control of the Maoists, it was a major nutritional shock and reduced access to healthcare. These are likely mechanisms at work and describe the results presented in the paper.

The sufficient time gap between the start of the conflict and the time of the NDHS 2016 allows me to explore the impacts of the conflict on children of the women who were exposed to conflict in their childhood. I find that the mothers' exposure to conflict is detrimental for their children's health. Although imprecise, impacts on children's height-for-age z-scores are negative. Results for children's weight-for-height, weight-for-age and BMI z-scores, on the other hand, are precisely estimated and again negative. Results are robust to alternative measure of conflict intensity (mother's district of birth). To explore possible intergenerational transmission mechanisms, I investigate the impacts on mother's economic and fertility outcomes. I find that women exposed to conflict during childhood have more children and live in a household with significantly less wealth. The combined effect of the two likely results in drastic decreases in the parental ability to invest in children.

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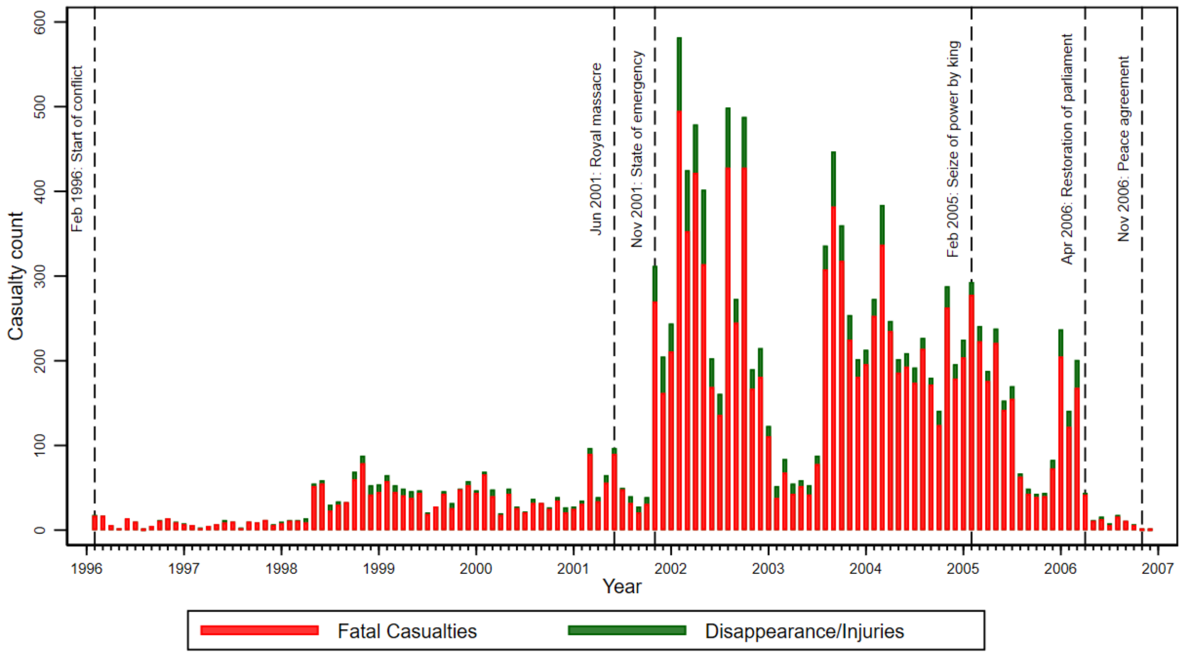
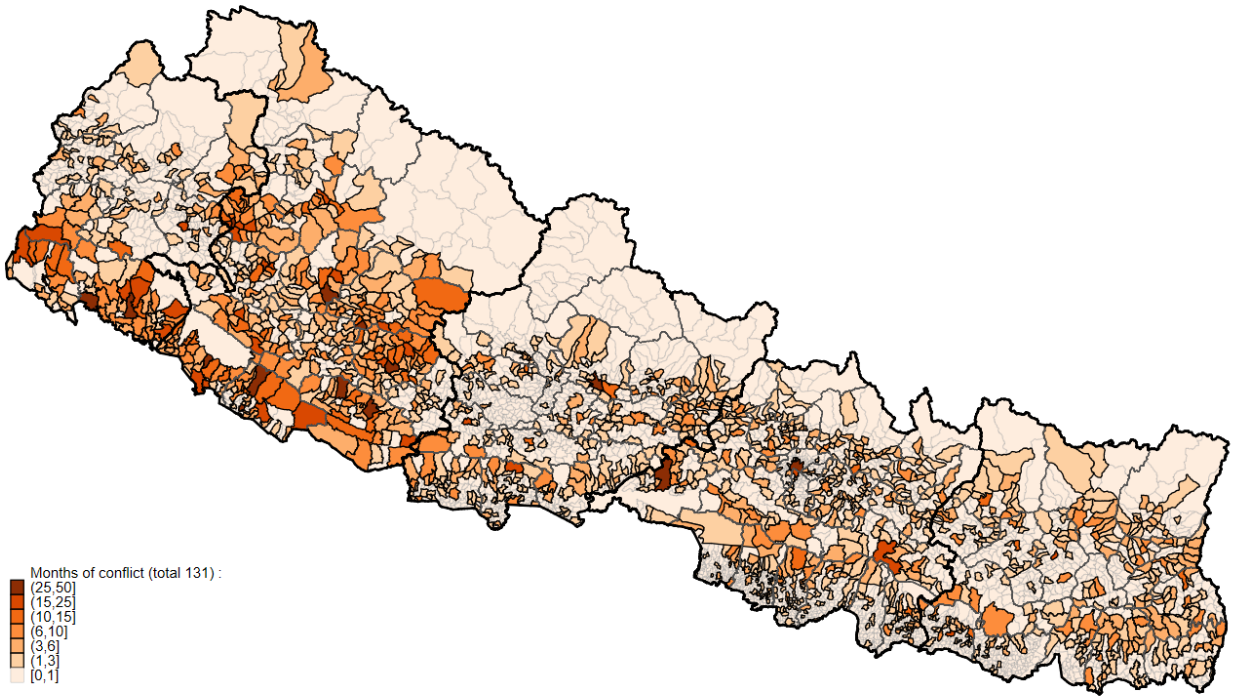
7 Figures and Tables

Figure 1: Conflict timeline



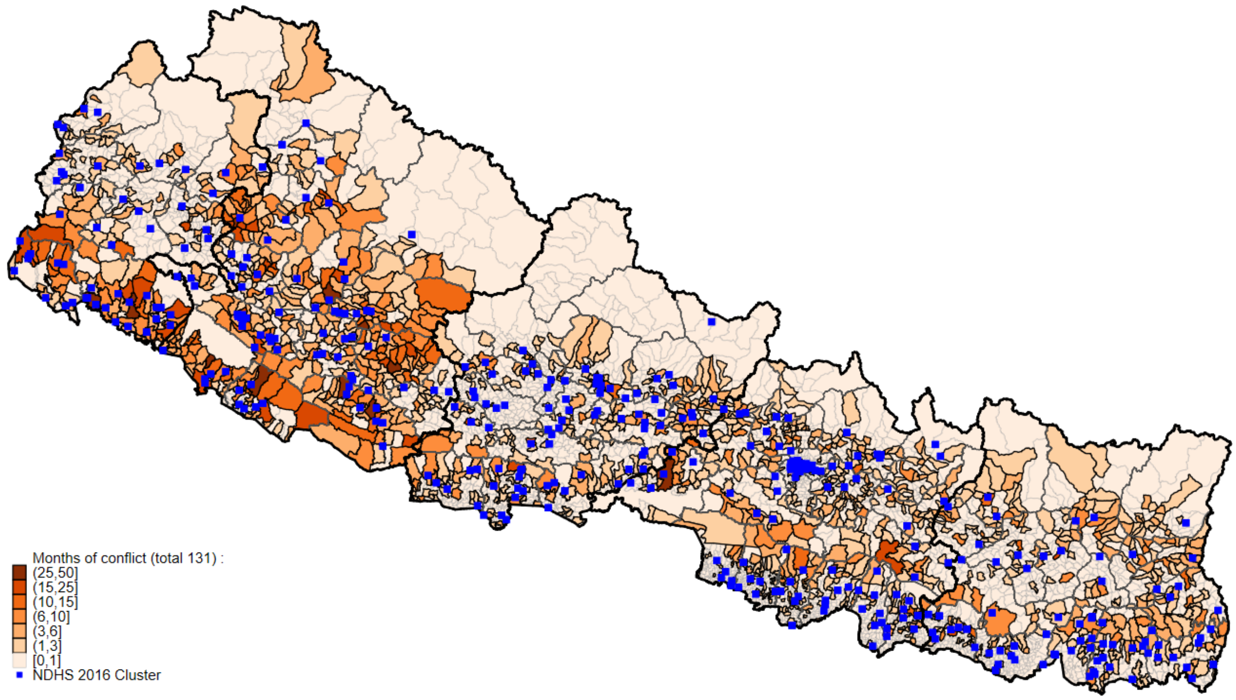
Source: Author's calculation based on the INSEC's archive on the conflict victims.

Figure 2: Conflict intensity heterogeneity: Months of war



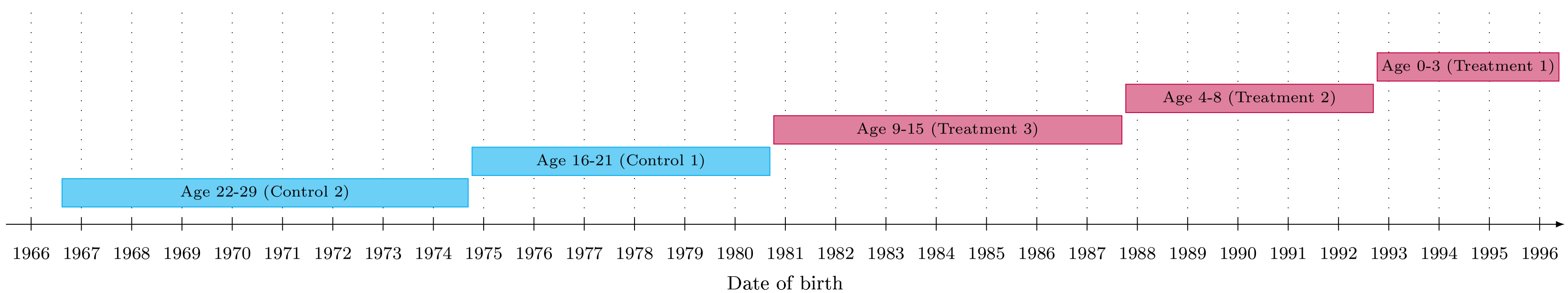
Source: Author's calculation based on the INSEC's archive on the conflict victims.

Figure 3: Conflict intensity heterogeneity: Months of war and NDHS 2016 clusters



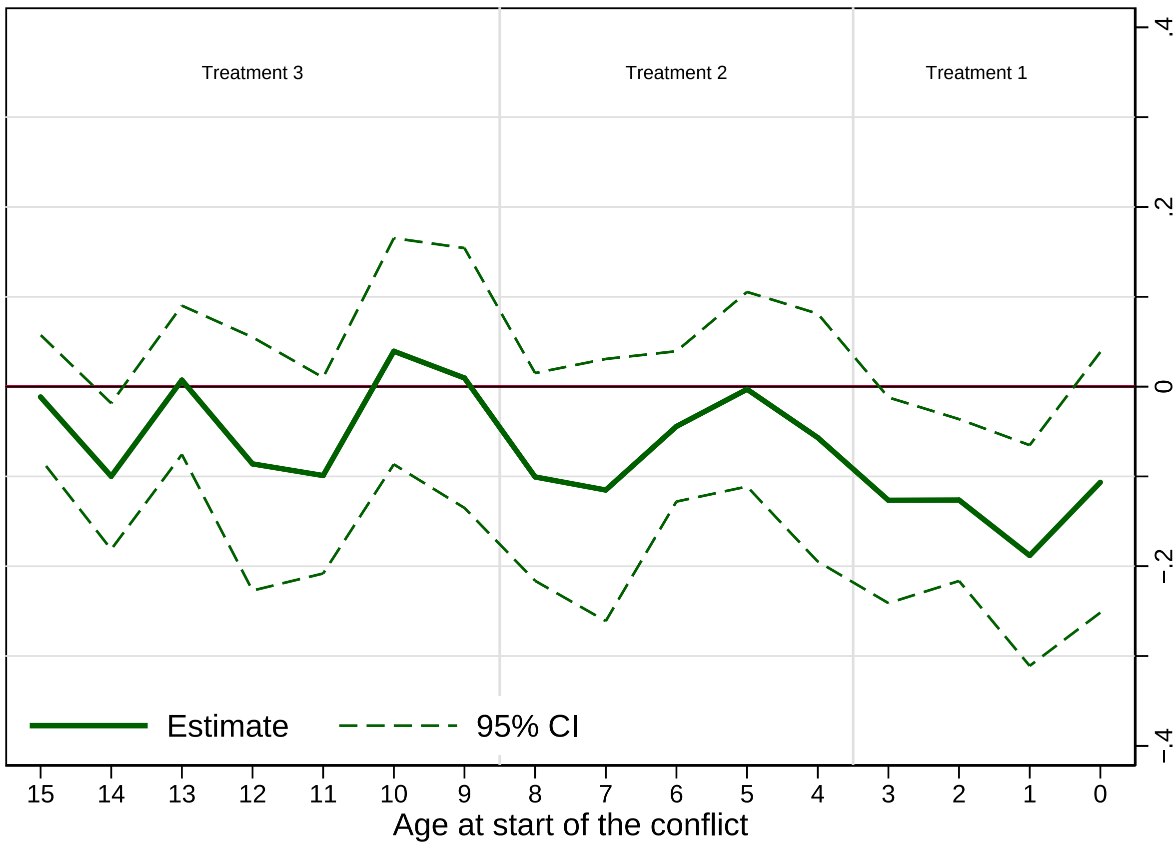
Source: Author's calculation based on the INSEC's archive on the conflict victims.

Figure 4: Cohorts by age at the start of the war in 1996



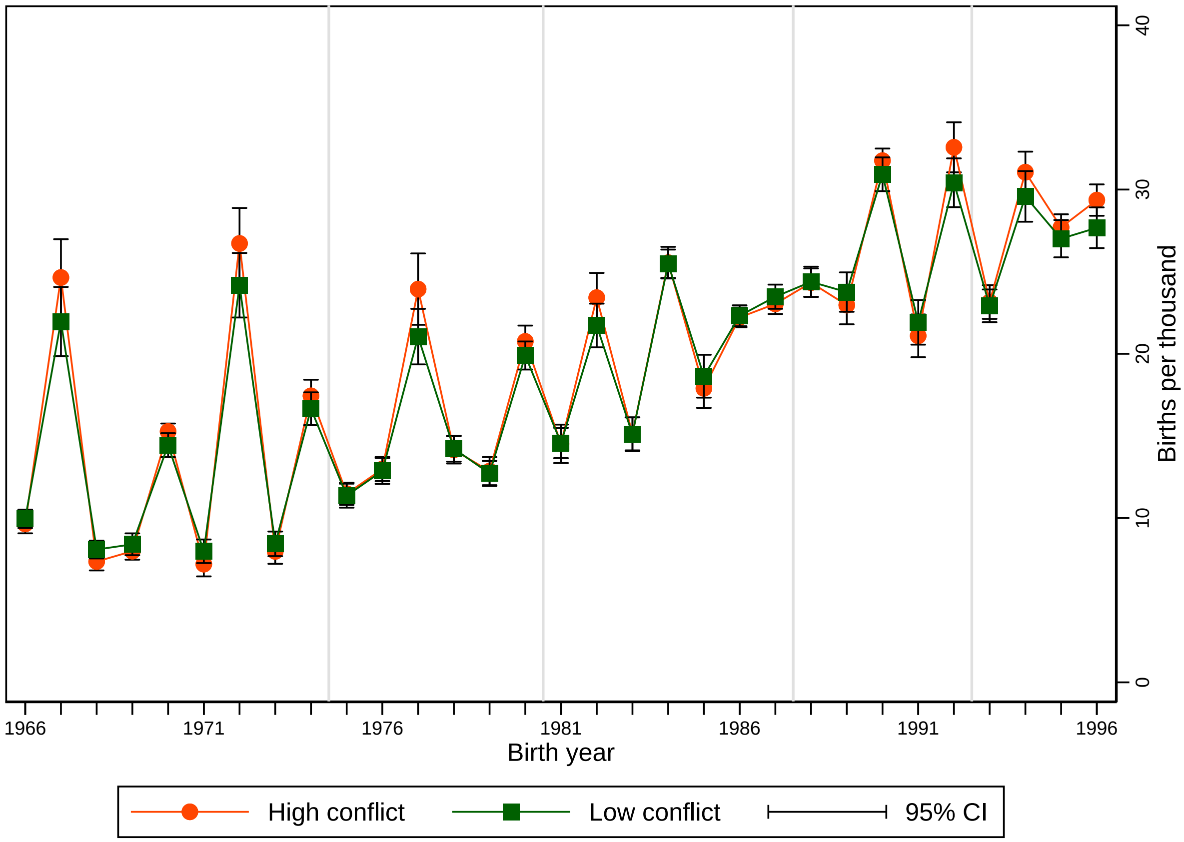
Note: Conflict started on February 13, 1996 or Falgun 1, 2052 Bikram Sambat (11^{th} month of year 2052 according to Nepali calendar). Age in the figure refers to the age at the beginning of the Nepal's civil war.

Figure 5: Impact on women's adult height (cm) by age at start of the war



Note: Figure presents coefficients on interaction between exposure to months of war and age at start of the civil war in main specification.

Figure 6: Births per 1000 district population using the 2001 Nepal population census



Note: High conflict areas are defined as districts that experienced above median level of conflict intensity (months of war). Birth rates are calculated using individuals observed in the 2001 Nepal population census and their year of birth.

Table 1: Characteristics of the victims of civil war in Nepal

Total casualties	14982	Political affiliation (%)	
Killed	13210	Nepali Congress	3.19
Disappeared	998	CPN-UML or ML	1.50
Injuried	774	CPN Maoist (rebel)	48.32
		Other parties	0.91
Perpetrator		No affiliation	46.07
State	9208		
Maoist	5302	Occupation (%)	
Other	472	Agriculture	21.01
		Wage laborer	2.27
Age (mean)	28.34	Employed	1.47
Female (%)	11.10	Teacher	1.68
		Police	11.92
Social caste (%)		Army	6.53
Bramin or Chettrey	44.76	Lawyer	0.05
Janajati, Aadibashi or Dalit	46.82	Doctor	0.04
Madeshi or Muslim	6.25	Politician	43.89
Other	2.17	Social worker	0.16
		Rights activists	0.03
Education (%)		Sports personality	0.05
Bachelor's degree or more	2.61	Driver	0.23
Intermediate	7.30	Student	5.50
Secondary school	26.26	Journalist	0.03
Lower secondary school	21.99	Businessman	1.57
Primary school	14.32	Ex-security personnel	0.01
Literate	15.05	Other, not clear	3.56
Illiterate	12.47		

Source: Author's calculation based on the INSEC's archive on the conflict victims (http://www.insec.org.np/victim/).

Note: While classes 8 to 10 are defined as secondary school, 6 and 7 are lower secondary school. Nepali Congress (Democratic) and Nepali Congress are combined as one as the former was formed due to a vertical split of Nepali Congress into two in 2002. However, the parties merged into one in 2007. Similarly, Communist Party of Nepal - Marxist Leninists (CPN-ML) was reunited with the Communist Party of Nepal - Unified Marxist Leninists (CPN-UML) in 2002 but few members refused to go along the merger forming a new party with the same name. Party's sister organizations and student wings are also accounted for while assigning party affiliation.

Table 2: Summary statistics of women ages 20 to 49 at time of the survey

Variables	Age at start of the war in 1996			Difference
	0 to 29 (All women)	0 to 15 (Treatment)	16 to 29 (Control)	
Panel A: Outcomes				
Height (cm)	151.56	151.75	151.28	0.46***
	[5.50]	[5.45]	[5.56]	(0.17)
Weight (kg)	52.04	51.36	53.05	-1.69***
	[10.05]	[9.52]	[10.73]	(0.31)
Body mass index	22.63	22.29	23.14	-0.85***
	[4.06]	[3.86]	[4.30]	(0.12)
Pregnancy loss (yes=1)	0.28	0.27	0.30	-0.04***
	[0.45]	[0.44]	[0.46]	(0.01)
Total births	2.88	2.25	3.81	-1.56***
	[1.65]	[1.20]	[1.77]	(0.04)
Age at first birth	19.74	19.54	20.04	-0.51***
	[3.19]	[2.99]	[3.45]	(0.10)
Years of education	3.83	5.05	2.04	3.01***
	[4.25]	[4.30]	[3.48]	(0.12)
Employed last 12 months (yes=1)	0.72	0.69	0.76	-0.07***
	[0.45]	[0.46]	[0.43]	(0.01)
Wealth index factor score	3879.78	3274.44	4776.24	-1501.79
	[96436.27]	[93601.64]	[100507.35]	(2957.08)
Panel B: Exposure to conflict				
B1: During 0-15 years				
Months of war	1.72	2.87	0.00	2.87***
	[4.63]	[5.71]	[0.00]	(0.14)
Number of casualties	3.12	5.22	0.00	5.22***
	[10.76]	[13.53]	[0.00]	(0.32)
Months inc. neighboring villages	6.22	10.43	0.00	10.43***
	[11.08]	[12.73]	[0.00]	(0.30)
B2: Whole life				
Months of war	5.45	5.49	5.39	0.10
	[8.27]	[8.28]	[8.26]	(0.25)
Number of casualties	10.41	10.55	10.20	0.35
	[20.85]	[21.01]	[20.60]	(0.64)
Months inc. neighboring villages	18.67	18.71	18.61	0.10
	[14.42]	[14.40]	[14.45]	(0.44)
Panel C: Controls				
Current age	33.48	27.85	41.83	-13.99***
	[8.07]	[4.45]	[3.93]	(0.13)
Female headed HH (yes=1)	0.34	0.37	0.30	0.07***
	[0.47]	[0.48]	[0.46]	(0.01)
Hight caste (yes=1)	0.39	0.37	0.41	-0.04***
	[0.49]	[0.48]	[0.49]	(0.01)
Rural (yes =1)	0.86	0.86	0.86	0.00
	[0.35]	[0.34]	[0.35]	(0.01)
Eastern region	0.19	0.18	0.21	-0.02**
	[0.39]	[0.39]	[0.40]	(0.01)
Central region	0.24	0.24	0.25	-0.00
	[0.43]	[0.43]	[0.43]	(0.01)
Western region	0.21	0.21	0.21	-0.00
	[0.41]	[0.41]	[0.41]	(0.01)
Mid-western region	0.21	0.22	0.20	0.02
	[0.41]	[0.42]	[0.40]	(0.01)
Far-western region	0.14	0.14	0.13	0.01
	[0.34]	[0.35]	[0.34]	(0.01)
Number of women	4,421	2,639	1,782	4,421

Note: Standard deviations are in brackets and standard errors are in parentheses and significance levels are denoted as follows: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 3: Summary statistics of children under 5 at time of the survey in 2016

Variables	Mother's age at start of the war in 1996: 0 to 29 (All women)	0 to 15 (Treatment)	16 to 29 (Control)	Difference
Panel A: Outcomes				
Height/age sd	-1.55	-1.52	-1.85	0.33***
	[1.34]	[1.33]	[1.39]	(0.11)
Weight/age sd	-1.35	-1.33	-1.50	0.17*
	[1.07]	[1.06]	[1.16]	(0.09)
Weight/height sd	-0.65	-0.65	-0.62	-0.03
	[1.10]	[1.09]	[1.15]	(0.09)
Body mass index sd	-0.51	-0.51	-0.45	-0.06
	[1.11]	[1.11]	[1.14]	(0.09)
Panel B: Mother's exposure to conflict				
B1: During 0-15 years				
Months of war	3.17	3.43	0.00	3.43***
	[6.01]	[6.17]	[0.00]	(0.49)
Number of casualties	5.83	6.29	0.00	6.29***
	[14.28]	[14.74]	[0.00]	(1.16)
Months inc. neighboring villages	11.79	12.73	0.00	12.73***
	[13.10]	[13.16]	[0.00]	(1.04)
B2: Whole life				
Months of war	4.69	4.73	4.10	0.63
	[7.42]	[7.41]	[7.64]	(0.61)
Number of casualties	8.85	8.92	8.09	0.82
	[18.74]	[18.55]	[20.92]	(1.53)
Months inc. neighboring villages	17.15	17.20	16.54	0.66
	[13.73]	[13.73]	[13.83]	(1.12)
Panel C: Controls				
Child sex (girl=1)	0.47	0.48	0.42	0.06
	[0.50]	[0.50]	[0.49]	(0.04)
Child birth order number	2.36	2.16	4.97	-2.81***
	[1.57]	[1.25]	[2.53]	(0.11)
Child is a twin (yes =1)	0.01	0.01	0.02	-0.01
	[0.11]	[0.11]	[0.14]	(0.01)
Female headed HH (yes=1)	0.33	0.33	0.30	0.03
	[0.47]	[0.47]	[0.46]	(0.04)
Hight caste (yes=1)	0.36	0.37	0.32	0.04
	[0.48]	[0.48]	[0.47]	(0.04)
Rural (yes =1)	0.89	0.89	0.93	-0.03
	[0.31]	[0.31]	[0.26]	(0.03)
Eastern region	0.18	0.18	0.24	-0.06*
	[0.39]	[0.38]	[0.43]	(0.03)
Central region	0.27	0.27	0.28	-0.01
	[0.44]	[0.44]	[0.45]	(0.04)
Western region	0.19	0.20	0.16	0.04
	[0.40]	[0.40]	[0.37]	(0.03)
Mid-western region	0.22	0.22	0.22	0.00
	[0.42]	[0.42]	[0.41]	(0.03)
Far-western region	0.13	0.14	0.11	0.03
	[0.34]	[0.34]	[0.31]	(0.03)
Number of children	2,168	2,007	161	2,168

Note: Standard deviations are in brackets and standard errors are in parentheses and significance levels are denoted as follows: * p<0.10, ** p<0.05, *** p<0.01.

Table 4: Impact on first generation adult stature by age at start of the civil war

	Height in cm			Height for age sd (HAZ)		
	(1)	(2)	(3)	(4)	(5)	(6)
Age 22 to 29 × Months of war	0.011	0.011	0.014	0.002	0.002	0.002
	(0.033)	(0.034)	(0.035)	(0.006)	(0.006)	(0.006)
Age 9 to 15 × Months of war	-0.026	-0.026	-0.027	-0.004	-0.004	-0.005
	(0.026)	(0.026)	(0.025)	(0.004)	(0.004)	(0.004)
Age 4 to 8 × Months of war	-0.068**	-0.067**	-0.071**	-0.012**	-0.011**	-0.012**
	(0.031)	(0.031)	(0.032)	(0.005)	(0.005)	(0.005)
Age0 to 3 × Months of war	-0.122***	-0.127***	-0.136***	-0.021***	-0.021***	-0.023***
	(0.033)	(0.032)	(0.032)	(0.006)	(0.005)	(0.005)
Observations	4,421	4,421	4,421	4,418	4,418	4,418
Adjusted R-squared	0.031	0.031	0.043	0.031	0.031	0.043
Birth year and month fixed effects		Yes	Yes		Yes	Yes
Regional trends and other controls			Yes			Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	383	383	383	383	383	383
Control mean (Age 16 to 21)	151.4	151.4	151.4	151.4	151.4	151.4

Note: *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Comparison cohort is age 16 to 21 and cohort 22 to 29 is a second comparison group that serves as a placebo test. Other controls include an indicator for high caste and month of interview fixed-effects.

Table 5: Impact on first generation adult height (cm) by alternative measure of conflict

	Casualty count	Including contiguous villages		Including villages within 50 km	
Conflict variable =	(1) Own village	(2) Months of war	(3) Casualty count	(4) Months of war	(5) Casualty count
Age 22 to 29 × Conflict	0.005	0.022	0.004	0.011	0.001
	(0.014)	(0.022)	(0.006)	(0.016)	(0.001)
Age 9 to 15 × Conflict	-0.013	-0.006	-0.002	-0.011	0.000
	(0.009)	(0.017)	(0.006)	(0.013)	(0.001)
Age 4 to 8 × Conflict	-0.030***	-0.013	-0.006	-0.006	0.000
	(0.011)	(0.020)	(0.006)	(0.016)	(0.001)
Age 0 to 3 × Conflict	-0.050***	-0.068***	-0.019***	-0.036*	-0.001
	(0.012)	(0.023)	(0.007)	(0.020)	(0.001)
Observations	4,421	4,421	4,421	4,421	4,421
Adjusted R-squared	0.042	0.042	0.042	0.040	0.040
Birth year and month fixed effects	Yes	Yes	Yes	Yes	Yes
Regional trends and other controls	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes
Number of clusters	383	383	383	383	383
Control mean (Age 16 to 21)	151.4	151.4	151.4	151.4	151.4

Note: *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Comparison cohort is age 16 to 21 and cohort 22 to 29 is a second comparison group that serves as a placebo test. Other controls include an indicator for high caste and month of interview fixed-effects.

Table 6: Impact of conflict at district of birth

	Migration			Height in cm			Height for age sd (HAZ)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age 22 to 29 × Months of war	0.001	0.001	0.001	-0.008	-0.007	-0.006	-0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.019)	(0.019)	(0.018)	(0.003)	(0.003)	(0.003)
Age 9 to 15 × Months of war	-0.001	-0.001	-0.001	-0.010	-0.008	-0.007	-0.002	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.012)	(0.011)	(0.011)	(0.002)	(0.002)	(0.002)
Age 4 to 8 × Months of war	-0.002	-0.001	-0.001	0.001	0.004	0.001	0.000	0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.013)	(0.013)	(0.012)	(0.002)	(0.002)	(0.002)
Age 0 to 3 × Months of war	-0.001	-0.001	-0.001	-0.030**	-0.030**	-0.030**	-0.005**	-0.005**	-0.005**
	(0.001)	(0.001)	(0.001)	(0.012)	(0.013)	(0.013)	(0.002)	(0.002)	(0.002)
Observations	4,421	4,421	4,421	4,421	4,421	4,421	4,418	4,418	4,418
Adjusted R-squared	0.064	0.066	0.123	0.008	0.008	0.019	0.008	0.007	0.019
Birth year and month fixed effects		Yes	Yes		Yes	Yes		Yes	Yes
Regional trends and other controls			Yes			Yes			Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	74	74	74	74	74	74	74	74	74
Control mean (Age 16 to 21	0.253	0.253	0.253	151.4	151.4	151.4	-2.056	-2.056	-2.056

Note: Conflict is defined at district level i.e. district of birth. *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at the district of birth. All ages in the table refer to age at the start of the war. Comparison cohort is age 16 to 21 and cohort 22 to 29 is a second comparison group that serves as a placebo test. Other controls include an indicator for high caste and month of interview fixed-effects.

Table 7: Impact on first generation reproductive health by age at start of the civil war

	(1) Ever had a stillbirth	(2) Ever had a miscarriage	(3) Ever had an abortion	(4) Total live births	(5) Number of infant deaths
Age 22 to 29 × Months of war	0.002	0.001	-0.007**	-0.004	-0.000
	(0.001)	(0.002)	(0.003)	(0.008)	(0.001)
Age 9 to 15 × Months of war	0.001	0.000	-0.004	0.002	0.000
	(0.001)	(0.002)	(0.002)	(0.006)	(0.001)
Age 4 to 8 × Months of war	0.002	0.001	-0.005*	0.013*	0.000
	(0.001)	(0.002)	(0.003)	(0.007)	(0.001)
Age0 to 3 × Months of war	0.003***	0.006*	-0.002	0.024***	-0.001
	(0.001)	(0.003)	(0.004)	(0.007)	(0.002)
Observations	4,421	4,421	4,421	4,421	4,421
Adjusted R-squared	0.022	0.018	0.061	0.466	0.003
Birth year and month fixed effects	Yes	Yes	Yes	Yes	Yes
Regional trends and other controls	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes
Number of clusters	383	383	383	383	383
Control mean (Age 16 to 21)	0.0764	0.164	0.142	3.520	0.003

Note: *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Comparison cohort is age 16 to 21 and cohort 22 to 29 is a second comparison group that serves as a placebo test. Other controls include an indicator for high caste and month of interview fixed-effects.

Table 8: Impact on sexual behavior and marriage by age at start of the civil war

	(1) Ever use contraceptive	(2) Number of sex partners	(3) Age at first sexual intercourse	(4) Age at first birth	(5) Age at first cohabitation	(6) Number of marriages or unions	(7) Smoke or chew tobacco
Age 22 to 29 × Months of war	-0.001	-0.003	-0.026	-0.030*	0.001	-0.020	-0.005**
	(0.002)	(0.003)	(0.019)	(0.017)	(0.002)	(0.020)	(0.002)
Age 9 to 15 × Months of war	-0.001	0.001	0.018	0.016	0.000	0.032*	-0.002
	(0.001)	(0.001)	(0.015)	(0.016)	(0.001)	(0.018)	(0.002)
Age 4 to 8 × Months of war	-0.002	-0.003	0.012	0.009	0.000	0.024	-0.001
	(0.002)	(0.003)	(0.019)	(0.020)	(0.001)	(0.020)	(0.002)
Age0 to 3 × Months of war	0.001	0.000	-0.028	-0.009	0.000	0.002	0.000
	(0.003)	(0.001)	(0.025)	(0.023)	(0.001)	(0.021)	(0.002)
Observations	4,421	4,421	4,421	4,420	4,420	4,421	4,421
Adjusted R-squared	0.110	-0.013	0.144	0.146	0.039	0.108	0.155
Birth year and month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional trends and other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	383	383	383	383	383	383	383
Control mean (Age 16 to 21)	0.872	1.065	17.56	17.50	1.059	19.89	0.195

Note: *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Comparison cohort is age 16 to 21 and cohort 22 to 29 is a second comparison group that serves as a placebo test. Other controls include an indicator for high caste and month of interview fixed-effects.

Table 9: Impact on education, employment and wealth by age at start of the civil war

	Education		Employment				
	(1) Years of schooling	(2) Completed SLC	(3) Employed in last 12 months	(4) Professional sales clerical etc	(5) Agri - own farm	(6) manual work	(7) wealth index factor score
Age 22 to 29 × Months of war	-0.015	-0.003	-0.005	-0.007**	0.006**	0.001	-182.432
	(0.025)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(440.164)
Age 9 to 15 × Months of war	0.003	-0.001	-0.003	-0.001	0.004**	-0.003	-504.890
	(0.018)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(323.558)
Age 4 to 8 × Months of war	0.007	-0.003	0.001	-0.005*	0.004*	0.002	-675.200*
	(0.025)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(367.459)
Age0 to 3 × Months of war	-0.020	-0.006**	-0.002	-0.004	0.005*	-0.001	-977.280**
	(0.031)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(393.707)
Observations	4,421	4,421	4,421	3,188	3,188	3,188	4,421
Adjusted R-squared	0.440	0.215	0.259	0.300	0.382	0.165	0.712
Birth year and month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional trends and other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	383	383	383	381	381	381	383
Control mean (Age 16 to 21)	2.472	0.0831	0.765	0.200	0.722	0.0781	3484

Note: School leaving certificate (SLC) is a national exam that everyone takes at the end of grade ten. DHS uses asset ownership such as televisions and bicycles, materials used for housing construction, and types of water access and sanitation facilities to calculate wealth index using factor analysis (see Rutstein, and Johnson, 2004 for detail). *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Comparison cohort is age 16 to 21 and cohort 22 to 29 is a second comparison group that serves as a placebo test. Other controls include an indicator for high caste and month of interview fixed-effects.

Table 10: Second generation health impact

	(1) Height for age sd (HAZ)	(2) Weight for height sd (WHZ)	(3) Weight for age sd (WAZ)	(4) Body mass index sd (BMIZ)
Mother's age 22 to 29 ×	0.048	-0.032	0.005	-0.045
Mother's exposure to conflict	(0.046)	(0.032)	(0.040)	(0.028)
Mother's age 9 to 15 ×	-0.010	-0.041**	-0.034*	-0.044***
Mother's exposure to conflict	(0.033)	(0.017)	(0.020)	(0.015)
Mother's age 4 to 8 ×	-0.005	-0.039**	-0.025	-0.040**
Mother's exposure to conflict	(0.030)	(0.017)	(0.022)	(0.017)
Mother's age 0 to 3 ×	-0.011	-0.030**	-0.025	-0.031**
Mother's exposure to conflict	(0.027)	(0.015)	(0.020)	(0.014)
Observations	2,165	2,163	2,169	2,164
Adjusted R-squared	0.131	0.114	0.132	0.110
Mother and other controls	Yes	Yes	Yes	Yes
Children contrls	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes
Number of clusters	373	373	373	373
Control mean (Mother's age 16 to 21)	-1.836	-0.580	-1.472	-0.423

Note: Sample is children aged 0 to 59 months at the time of the survey. *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. Mother's age in the table refers to mother's age at the start of the war. Comparison cohort is children born to mothers whose age was 16 to 21 at the start of the war. Children born to mother's cohort 22 to 29 is a second comparison group that serves as a placebo test. Mother's controls are mother's years of birth fixed effects, mother's month of birth fixed effects, region specific trends. Household controls are indicator for high caste, female headed households, and whether residing in a rural area. Child controls are indicator if child is a girl, a twin, birth order fixed effect, and fixed effects for child years of birth, month of birth, and month of anthropometric measurements. Reported outcomes are z-scores based on the WHO anthropometric measurement standards.

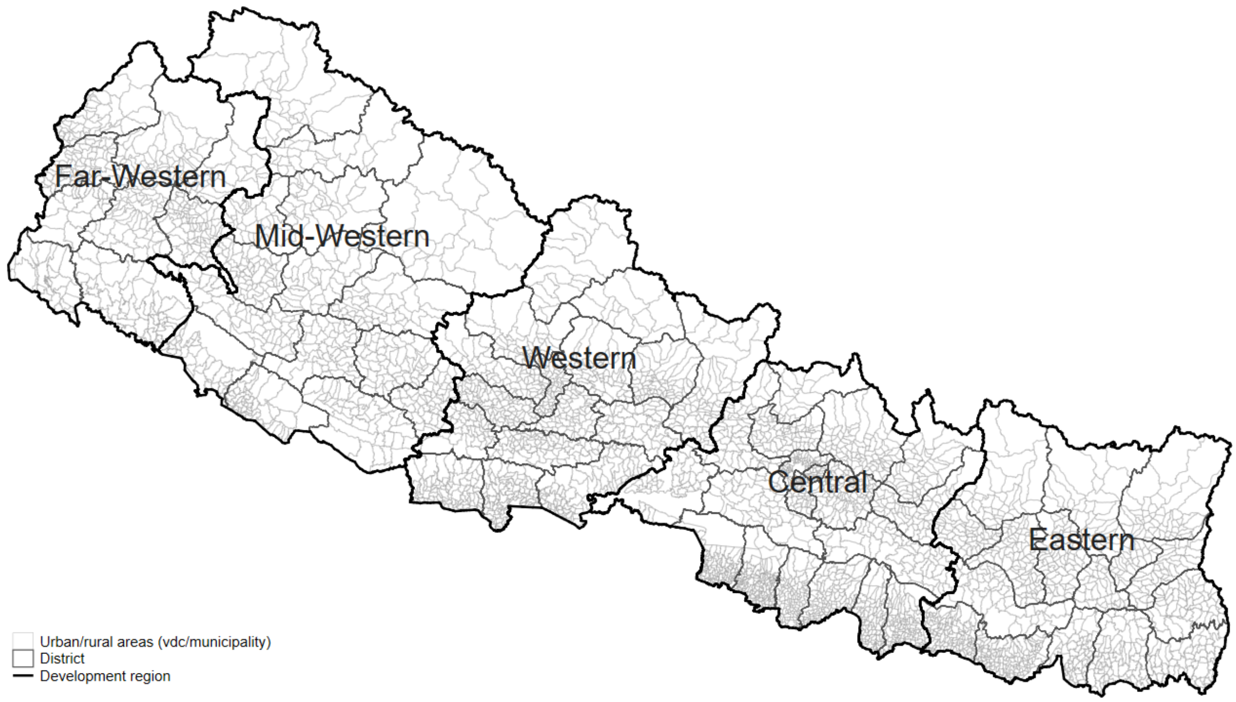
Table 11: Second generation health impact by mother's district of birth

	(1) Height for age sd	(2) Weight for height sd	(3) Weight for age sd	(4) Body mass index sd
Mother's age 22 to 29 ×	0.016	-0.007	-0.001	-0.011
Mother's exposure to conflict	(0.013)	(0.008)	(0.009)	(0.008)
Mother's age 9 to 15 ×	-0.006	-0.014**	-0.016**	-0.015**
Mother's exposure to conflict	(0.007)	(0.006)	(0.006)	(0.006)
Mother's age 4 to 8 ×	-0.003	-0.013**	-0.012**	-0.015**
Mother's exposure to conflict	(0.006)	(0.006)	(0.006)	(0.006)
Mother's age 0 to 3 ×	-0.003	-0.013**	-0.012**	-0.016***
Mother's exposure to conflict	(0.006)	(0.006)	(0.005)	(0.005)
Observations	2,165	2,163	2,169	2,164
Adjusted R-squared	0.181	0.094	0.130	0.095
Mother and household controls	Yes	Yes	Yes	Yes
Children controls	Yes	Yes	Yes	Yes
Mother's district of birth fixed effects	Yes	Yes	Yes	Yes
Number of clusters	74	74	74	74
Control mean (Age 16 to 21)	-1.836	-0.580	-1.472	-0.423

Note: Conflict is defined at district level i.e. mother's district of birth. Sample is children aged 0 to 59 months at the time of the survey. *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. Mother's age in the table refers to mother's age at the start of the war. Comparison cohort is children born to mothers whose age was 16 to 21 at the start of the war. Children born to mother's cohort 22 to 29 is a second comparison group that serves as a placebo test. Mother's controls are mother's years of birth fixed effects, mother's month of birth fixed effects, region specific trends. Household controls are indicator for high caste, female headed households, and whether residing in a rural area. Child controls are indicator if child is a girl, a twin, birth order fixed effect, and fixed effects for child years of birth, month of birth, and month of anthropometric measurements. Reported outcomes are z-scores based on the WHO anthropometric measurement standards.

A Appendix

Figure A.1: Administrative map of Nepal



Note: The map represents administrative areas before the 2015 constitution when Nepal was divided into 5 development regions, 75 districts and about 4000 rural (village development committees) and urban (municipalities) areas.

Figure A.2: Conflict intensity heterogeneity: Casualty count

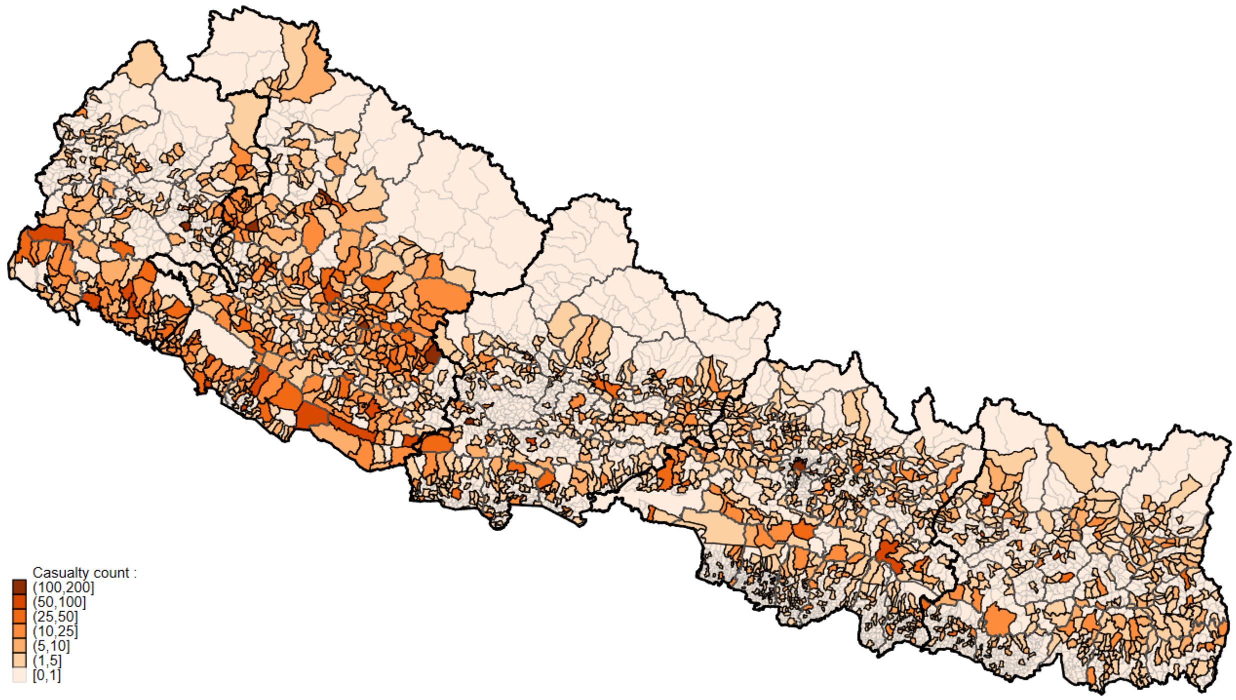


Figure A.3: Nepal Demographic Health Survey 2016 Coverage

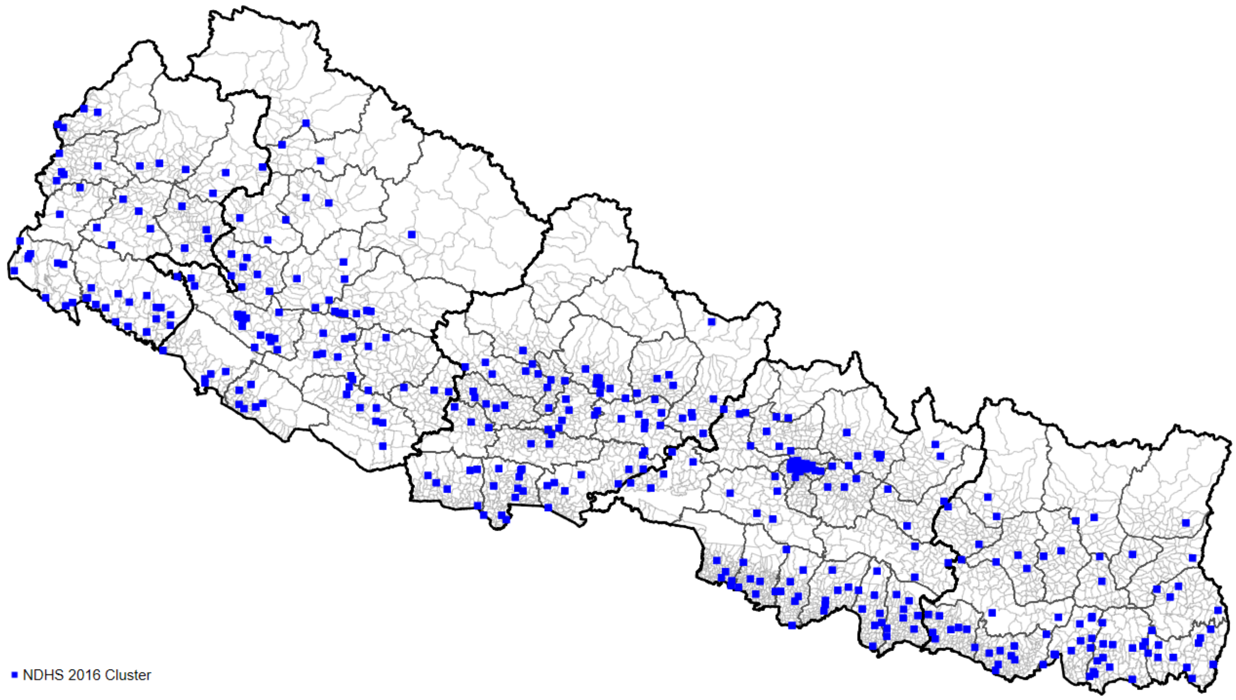


Figure A.4: Conflict intensity heterogeneity: Casualty count and NDHS 2016 clusters

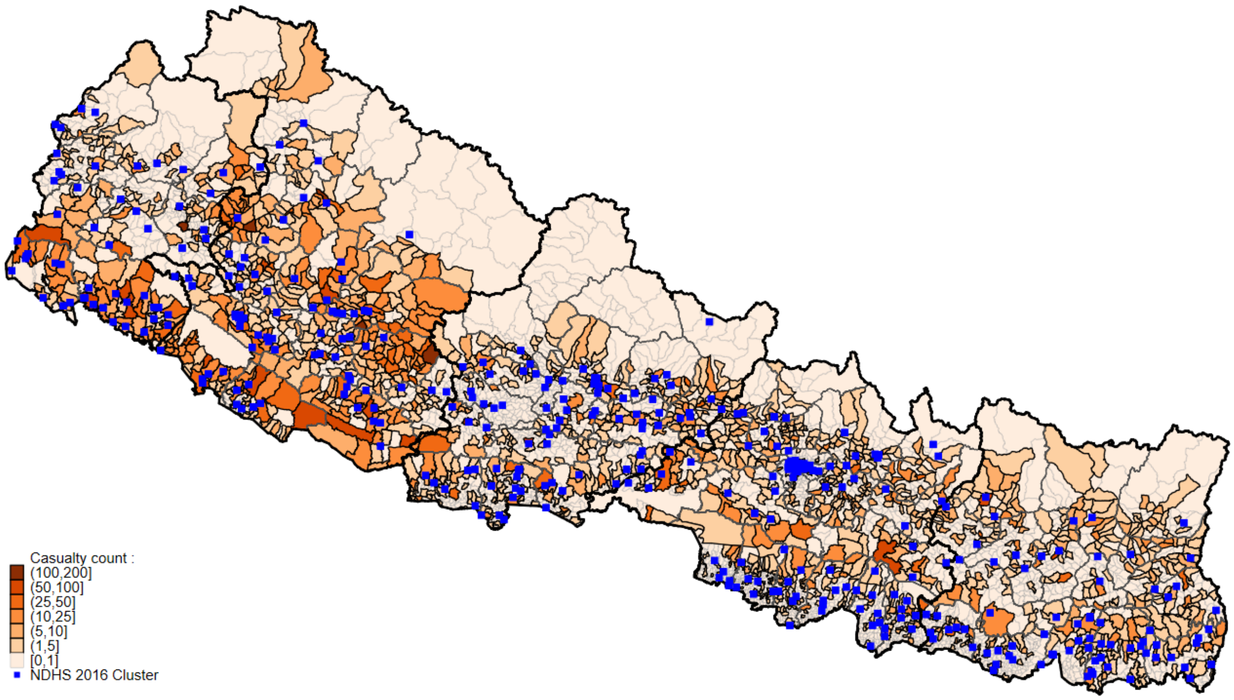
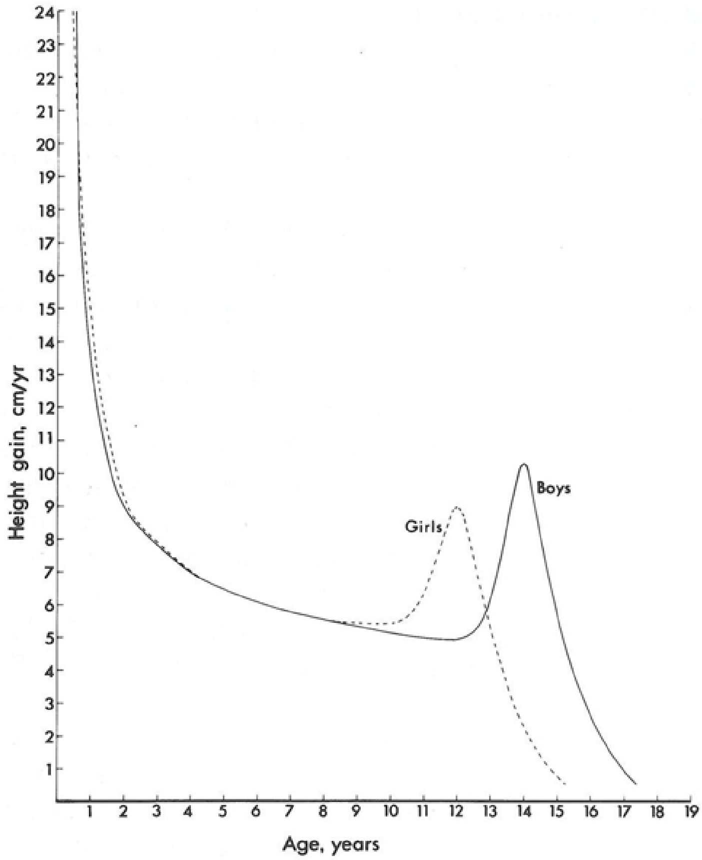


Figure A.5: Typical growth velocity curve



Source: Adopted from Tanner, Whitehouse, and Takaishi (1966). *Archives of disease in childhood* vol. 41,220 (1966): 613-35.

Table A.1: Impact on first generation adult stature using alternative specification

	Height in cm			Height for age sd		
	(1)	(2)	(3)	(4)	(5)	(6)
Months of war during 0 to 3 years	-0.026	-0.011	-0.103	-0.008	-0.007	-0.021
	(0.334)	(0.338)	(0.361)	(0.056)	(0.057)	(0.061)
Months of war during 4 to 8 years	-0.130**	-0.171***	-0.173***	-0.022**	-0.029***	-0.029**
	(0.056)	(0.064)	(0.067)	(0.009)	(0.011)	(0.011)
Months of war during 9 to 15 years	0.009	-0.052*	-0.060**	0.002	-0.009*	-0.010**
	(0.024)	(0.028)	(0.028)	(0.004)	(0.005)	(0.005)
Observations	4,421	4,421	4,421	4,418	4,418	4,418
Adjusted R-squared	0.027	0.029	0.041	0.027	0.029	0.041
Birth year and month fixed effects		Yes	Yes		Yes	Yes
Regional trends and other controls			Yes			Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	383	383	383	383	383	383
Outcome mean	151.6	151.6	151.6	-2.034	-2.034	-2.034

Note: *** (**) (*) indicates significance at the 1% (5%) (10%) level. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Other controls include an indicator for high caste and month of interview fixed-effects. Specification used is $Y_{imntvdr} = \beta_0 + \beta_1 \times \text{Exposure during 0 to 3 years} + \beta_2 \times \text{Exposure during 4 to 8 years} + \beta_3 \times \text{Exposure during 9 to 15 years} + \alpha_t + \eta_m + \delta_v + \gamma_r^T + X_i + \omega_n + \varepsilon_{imntvdr}$, where Y is a height of a woman i born in a month m and year t, and residing in village v. district d and development region r. Conflict variables are defined as women's exposure to conflict during 0 to 3 years, 4 to 8 years, and 9 to 15 years of age. All other variables have same meaning as the main specification equation 7. Reported in the table are the estimated β_1, β_2, and β_3 coefficients.

Table A.2: Impact on first generation adult height (cm) using alternative specification and alternative measure of conflict

Conflict variable =	Casualty count	Including contiguous villages	
	(1) Own village	(2) Months of war	(3) Casualty count
Months of war during 0 to 3 years	-0.033	-0.003	-0.007
	(0.148)	(0.084)	(0.040)
Months of war during 4 to 8 years	-0.069***	-0.101***	-0.027***
	(0.019)	(0.034)	(0.010)
Months of war during 9 to 15 years	-0.021**	-0.019	-0.006
	(0.010)	(0.018)	(0.005)
Observations	4,421	4,421	4,421
Adjusted R-squared	0.041	0.041	0.041
Birth year and month fixed effects	Yes	Yes	Yes
Regional trends and other controls	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes
Number of clusters	383	383	383
Outcome mean	151.6	151.6	151.6

Note: *** (**) (*) indicates significance at the 1% (5%) (10%) level. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Other controls include an indicator for high caste and month of interview fixed-effects. Specification used is $Y_{imtvdr} = \beta_0 + \beta_1 \times \text{Exposure during 0 to 3 years} + \beta_2 \times \text{Exposure during 4 to 8 years} + \beta_3 \times \text{Exposure during 9 to 15 years} + \alpha_t + \eta_m + \delta_v + \gamma_r^T + X_i + \varepsilon_{imtvdr}$, where Y is a height of a woman i born in a month m and year t, and residing in village v. district d and development region r. Conflict variables are defined as women's exposure to conflict during 0 to 3 years, 4 to 8 years, and 9 to 15 years of age. All other variables have same meaning as the main specification equation 6. Reported in the table are the estimated β_1, β_2, and β_3 coefficients.

Table A.3: Impact on first generation adult height (cm) - women living in the same district as birth

	Height in cm			Height for age sd		
	(1)	(2)	(3)	(4)	(5)	(6)
Age 22 to 29 × Months of war	-0.026	-0.028	-0.023	-0.004	-0.005	-0.004
	(0.047)	(0.046)	(0.047)	(0.008)	(0.008)	(0.008)
Age 9 to 15 × Months of war	-0.003	-0.001	-0.004	-0.000	-0.000	-0.001
	(0.039)	(0.039)	(0.039)	(0.007)	(0.007)	(0.007)
Age 4 to 8 × Months of war	-0.069*	-0.066	-0.074*	-0.011*	-0.011	-0.012
	(0.041)	(0.043)	(0.044)	(0.007)	(0.007)	(0.007)
Age0 to 3 × Months of war	-0.145***	-0.148***	-0.162***	-0.024***	-0.025***	-0.027***
	(0.046)	(0.046)	(0.046)	(0.008)	(0.008)	(0.008)
Observations	3,243	3,243	3,243	3,242	3,242	3,242
Adjusted R-squared	0.024	0.023	0.032	0.025	0.023	0.033
Birth year and month fixed effects		Yes	Yes		Yes	Yes
Regional trends and other controls			Yes			Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	380	380	380	380	380	380
Control mean (Age 16 to 21)	151.3	151.3	151.3	-2.089	-2.089	-2.089

Note: Sample is limited to women living in the same district as their birth. *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. All ages in the table refer to age at the start of the war. Comparison cohort is age 16 to 21 and cohort 22 to 29 is a second comparison group that serves as a placebo test. Other controls include an indicator for high caste and month of interview fixed-effects.

Table A.4: Control experiment of district birth rates (yearly births)

	Conflict: Months of war in district			Conflict: Casualties per 1000 district 1991 population		
	(1)	(2)	(3)	(4)	(5)	(6)
Births between 1966 to 1974 × Conflict	-0.009	-0.009	-0.009	-0.016	-0.016	-0.016
	(0.006)	(0.006)	(0.006)	(0.136)	(0.138)	(0.139)
Births between 1981 to 1987 × Conflict	-0.007	-0.007	-0.007	-0.142	-0.142	-0.142
	(0.011)	(0.011)	(0.011)	(0.179)	(0.182)	(0.183)
Births between 1988 to 1992 × Conflict	0.026	0.026	0.026	0.426	0.426	0.426
	(0.022)	(0.022)	(0.022)	(0.397)	(0.403)	(0.406)
Births between 1993 to 1996 × Conflict	0.043	0.043	0.043	0.732*	0.732	0.732
	(0.026)	(0.027)	(0.027)	(0.434)	(0.441)	(0.444)
Observations	2,325	2,325	2,325	2,325	2,325	2,325
Adjusted R-squared	0.447	0.437	0.809	0.446	0.436	0.808
District fixed effects		Yes	Yes		Yes	Yes
Birth year fixed effects			Yes			Yes
Number of clusters	75	75	75	75	75	75
Control mean (Births between 1975 to 1980)	15.69	15.69	15.69	15.69	15.69	15.69

Note: Yearly births are calculated using individuals observed in the 2001 Nepal population census and their year of birth normalized to 1000 districts inhabitants in 2001. *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at district level.

Table A.5: Second generation health impact using alternative measure of conflict

Conflict variable =	Casualty count own village			Months of war including contiguous villages			Casualty count including contiguous villages		
	(1) HAZ	(2) WHZ	(3) BMIZ	(4) HAZ	(5) WHZ	(6) BMIZ	(7) HAZ	(8) WHZ	(9) BMIZ
Mother's age 22 to 29 ×	0.028	-0.009	-0.015	0.063***	-0.003	-0.015	0.023***	-0.003	-0.007
Mother's exposure to conflict	(0.024)	(0.019)	(0.019)	(0.022)	(0.016)	(0.016)	(0.007)	(0.006)	(0.006)
Mother's age 9 to 15 ×	-0.009	-0.010***	-0.011***	-0.001	-0.018*	-0.020*	-0.002	-0.006**	-0.007**
Mother's exposure to conflict	(0.009)	(0.004)	(0.004)	(0.014)	(0.010)	(0.010)	(0.005)	(0.003)	(0.003)
Mother's age 4 to 8 ×	-0.005	-0.011*	-0.010*	-0.004	-0.018*	-0.020**	-0.001	-0.007**	-0.007**
Mother's exposure to conflict	(0.008)	(0.006)	(0.006)	(0.013)	(0.010)	(0.010)	(0.004)	(0.003)	(0.003)
Mother's age 0 to 3 ×	-0.008	-0.005	-0.005	-0.000	-0.013	-0.016	-0.001	-0.005*	-0.005*
Mother's exposure to conflict	(0.006)	(0.005)	(0.005)	(0.013)	(0.010)	(0.010)	(0.004)	(0.003)	(0.003)
Observations	2,165	2,163	2,164	2,165	2,163	2,164	2,165	2,163	2,164
Adjusted R-squared	0.229	0.119	0.116	0.231	0.119	0.116	0.232	0.120	0.117
Mother and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Child controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	373	373	373	373	373	373	373	373	373
Control mean (Age 16 to 21)	-1.836	-0.580	-0.423	-1.836	-0.580	-0.423	-1.836	-0.580	-0.423

Note: Sample is children aged 0 to 59 months at the time of the survey. *** (**) (*) indicates significance at the 1% (5%) (10%) level. Treatment on the treated estimates are reported based on a difference-in-difference specification. Standard errors are clustered at village level. Mother's age in the table refers to mother's age at the start of the war. Comparison cohort is children born to mothers whose age was 16 to 21 at the start of the war. Children born to mother's cohort 22 to 29 is a second comparison group that serves as a placebo test. Mother's controls are mother's years of birth fixed effects, mother's month of birth fixed effects, region specific trends. Household controls are indicator for high caste, female headed households, and whether residing in a rural area. Child controls are indicator if child is a girl, a twin, birth order fixed effect, and fixed effects for child years of birth, month of birth, and month of anthropometric measurements. Reported outcomes are z-scores based on the WHO anthropometric measurement standards.