Political Violence and Child Health: Results from Zimbabwe

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Abstract

The article examines the impact of politically motivated violence in Zimbabwe between 2000 and 2005 that followed the 2000 referendum on children's health. The year 2000 also marked the start of the controversial land reform, which led to a large increase in food insecurity in the country. I made use of the 1999 and 2005/06 Demographic and Health Surveys and information on the location and date of violent events from the Armed Conflict Location and Event dataset. To identify the impact of violence on children's stature, the empirical analysis exploits temporal and spatial variation across birth cohorts. Children born after the spike in violence in 2000 had lower height-for-age than children from earlier cohorts did. This long-term effect is greater in rural areas and for older children in particular. I probe the validity of my results by assessing the robustness of results to alternative control groups, selective mortality, migration, and find that the results hold. These results are largely consistent with the literature on countries that experienced full-fledged civil wars, suggesting that state repression and political violence may lead to similar negative effects on population health as large-scale armed conflicts, and thus, may require similar levels of international assistance.

Keywords: human capital, child health, conflict, height-for-age, sub-Saharan Africa

JEL classification: I12, J13, O12

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I. Introduction

The severity and the length of armed conflict, such as civil war, has decreased in the past 30 years (World Bank 2011). Shorter-term conflicts such as low-scale insurgencies, revolutions, and riots often triggered by rising prices or other unpopular government policies[1] replaced large-scale civil wars. The effects of these conflict events on population have been extensively researched by the economists and political scientists alike (World Bank 2011). However, one type of conflict, political and economic repression of the population, by an own country's government and its effect on country's population has received far less attention. Political repression and persecution for political views and associations have been extensively researched by political scientists (see review by Davenport (2007)) with many studies focused on understanding determinants of political repression at a country level (e.g. Henderson 1991; Davenport 1995) and economists, focusing on modelling of the situation (Besley and Persson 2011). At the microeconomic, disaggregated level, development economists have not yet studied this type of internal conflict extensively because such conflicts typically happen in relatively closed economies with little measurable data on the internal state of affairs. A widely researched case of political repression is the Cultural Revolution in China and its effect on education and labor market outcomes (e.g. Giles et al. 2008; Meng and Gregory 2002). Other notable examples of state repressions include: 1) the 1976-1983 Argentina Dirty war, a period of state terrorism against left-wing guerillas and their sympathizers, during which 22,000 people were killed or disappeared[2]; 2) the 1936-1939 Great Purge by Joseph Stalin in the Soviet Union that killed millions of people or sent them to work camps or gulags; 3) the North Korean regime; 4) the Mao regime in China, and finally, of the particular interest to our analysis, 5) the 2000-2005 political violence in Zimbabwe by ZANU-PF, the ruling party of Zimbabwe. This particular period of widespread repression started in 2000 and was followed by a deep economic crisis, hyperinflation, and persistence of hunger and personal insecurity for many Zimbabweans. This paper focuses on the impact of these events in Zimbabwe on the health outcomes of young children who were less than 60 months old.

[1] Some recent examples include riots in Brazil, Turkey, and Ukraine in 2013.
[2] Global Security, 2014. "Argentina Dirty War 1976-1983". http://www.globalsecurity.org/military/world/war/argentina.htm. Accessed: June 18, 2014.

This study contributes to the following strands of the development economics literature. First, it adds to a growing literature on the impacts of armed conflict on human capital and, in particular, on education and health outcomes of young children (e.g. Akbulut-Yuksel 2014; Akresh et al. 2011, 2012; Bundervoet et al. 2009; Minoiu and Shemyakina 2012, 2014; Verwimp 2012). Second, it contributes to the literature on the impact of political repression on the well-being of individuals in a developing country (e.g. Kim 2011; Giles et al. 2008; Neupert and Prum 2005). This paper is one of the first to address the impacts of state-sponsored violence on child health in an African country. Thirs, this study contributes to the literature on food security in conflict-affected countries.

While Zimbabwe has a long history of political violence, with a civil war that ended only in 1979, the events following the February 2000 referendum and the June 2000 elections were particularly violent, marking the start of a new period in the country's history. The 2000 referendum was followed by violent invasions of commercial farms sanctioned by the state. ZANU-PF took advantage of a latent demand for land by rural segments and war veterans to ensure its political survival against the rapidly rising in popularity opposition party, the Movement for Democratic Change (MDC). The land redistribution was also a fulfillment of the nationalist promise of the ruling party that was one of the motivators of the liberation struggle. The state also severely clamped down on the supporters of a new opposition party, MDC, formed in September of 1999 and that gained significant momentum and support among the urban poor and in rural areas by 2000. Following this increase in violence, in a matter of months, Zimbabwe, known at the time as a "bread basket of Africa", spiraled into a downward growth path marked by hyperinflation and the population becoming dependent on food aid.

This severe decline in living standards and availability of food have undeniably affected health of young children. A large literature on child health suggests that shocks in early childhood have long-term effects on the well-being of the surviving children, reflected in part in their educational attainment, their stature, health, labor market, and cognitive outcomes (Almond and Currie 2010).

There is a rapidly growing literature on the effects of armed conflicts on child health. These studies use cohort and region-specific exposure to armed conflict to identify the effect of the conflict and

uniformly find that exposure to conflict at a young age has a detrimental effect on the long-term health-outcomes. The empirical analysis in this field typically limited to the sample of the surviving children that did not migrate outside country's borders. Therefore, the effects observed are conservative estimates of actual conflict impacts. In this context, several studies examined the effects of conflict on the height-for-age z-scores, a commonly used measure of long-term health status of young children. Akresh et al. (2011) compare the effects of the drought and the civil war crises in Rwanda and find gender differentiated outcomes. In the wake of the drought, girls' height to age z-scores declined more than these of boys, while the conflict affected boys and girls in a similar negative way. Other related studies also document similar impacts for boys and girls during armed conflicts (e.g. Bundervoet et al. 2009; Akresh et al. 2012; Minoiu and Shemyakina 2012, 2014). Lower height can lead to poorer health and education outcomes in the future. In the context of Zimbabwe, a seminal study on resettlement farmers shows that children who received poor nutrition due to drought and a concurrent civil war had significantly lower stature (Alderman et al. 2006). Shorter children were considered younger and therefore were enrolled in school at a later age than taller kids, thus completing less schooling. In Burundi, Verwimp (2012) observed an increased mortality risk for children whose growth was stunted by armed conflict.

This paper contributes to the study of the measurement of food insecurity in countries affected by conflict. It links hunger and sub-nutrition to child height for age z-scores, which is a long-term measure of child health. This measure is focused on one of the most vulnerable segments of society affected by conflict - young children, however it may not reflect on the overall per capita food availability in the household, which could be larger or smaller. For many of sub-Saharan countries, the data on actual availability of different food groups in the country could be poor and also may not reflect on the consumption by the population because while food maybe available at the country level, it may not be affordable or may not be available uniformly across different country locations. Thus, anthropometric measures such as height for age z-scores could be a good proxy of the actual food intake by population across the country. Further, as we have data on the regional effects of political violence, we can link children height for age z-scores to the conflict while they were growing up and to number of months

children were exposed to food deprivation measured by conflict activity in a particular region. Thus, since violent conflict and political repression is often associated with lack of foodstuffs, by using height for age scores of children we can measure the partial effect of conflict on food security.

This study contributes to the literature discussed above and is one of the first to examine the effect of several violent periods in Zimbabwe between 2000 and 2005 on the children' nutritional status and their health, measured by height-for-age z-scores, a common measure of long-term health. The identification strategy exploits regional and cohort variation in the effects of political violence and insecurity during 2000-2005 on child's health. The study combines data on household and child characteristics with information on the exact dates and locations of conflict events from the Armed Conflict Locations and Event Dataset (ACLED) (Raleigh et al. 2010). The study makes use of the 1999 and 2005/2006 Zimbabwe Demographic and Health Surveys (ZDHS) that bracket the period of violence under consideration.[3] The 1999 data was collected before violence started and the 2005/2006 survey was conducted after violence subsided. This timing of data collection allows us to control for pre-conflict differentials in child health. All provinces of Zimbabwe were affected by violence to some extent over the 2000-2005, with a large variation in the number of conflict events. To reduce the influence of outliers, we use a natural logarithm of the number of events recorded in each province between 2000 and 2005 as a main measure of violence.[4]

We find that children born after the 2000 wave of violence in the provinces with more instances of violence had significantly lower height-for-age z-scores (HAZ) than children surveyed in 1999. Furthermore, the length of exposure to the crisis, both linear (months of exposure) and non-linear (with 1-24 months of exposure, and more than 24 months) combined with the province level intensity of violence had a significant and negative impact on child's HAZ, with older children experiencing larger setbacks in their health. This result is consistent with the literature (e.g. Bundervoet et al. 2009). Children in rural areas were impacted the most. The results are robust to the inclusion of multiple control variables, such as

[3] Similar analysis techniques were used by Akresh and de Walque (2012) and Minoiu and Shemyakina (2012).

[4] The geographical distribution of events over time is presented in Appendix A.

controls for the language of interview, age and education of the household head, and child's mother, household's assets, child's age in months, and province and year of birth fixed effects. Examining the specific impacts of conflict for sub-groups, in rural areas, both boys and girls exposed to conflict for more than 24 months were negatively affected. We further investigate the impact of conflict on child health using an alternative control and treatment groups and the main results remain robust. We perform multiple checks for the sample composition by comparing the 1999 and the 2005/2006 DHS survey data and test for selective mortality by gender. We also apply placebo tests to survey data from an earlier period to probe the assumption that conflict locations are random and that our results are not driven by pre-existing differences in cohort health. Our results remain robust to these tests.

The remainder of the paper is organized as follows. In Section 2 describe the historical context of the Ivorian conflict. Section 3 presents the data and the estimation strategy. Section 4 discusses our baseline results, robustness checks and mechanisms through which political violence may have affected child health. Section 5 further discusses the results and concludes.

2. Background: Political violence in Zimbabwe: 1997-2008

The history of Zimbabwe, formerly South Rhodesia, is marked by many violent events. After the WII, the British government was giving up its colonial powers around the world, and planned to establish majority rule in the united region of Northern Rhodesia (currently Zambia), Southern Rhodesia, and Nyasaland (currently Malawi). Around 1964, the majority black rule was established in Northern Rhodesia and Malawi. However, the Southern Rhodesia's white-led government did not support the majority rule policy. In 1970, it established a republic controlled by white minority with the government led by Ian Smith. Soon thereafter, two insurgent organizations, the Zimbabwe African People's Union (ZAPU) and the Zimbabwe African National Union – Patriotic Front (ZANU-PF) challenged the white-minority government and a vicious civil war ensued. The Rhodesian Bush war lasted between July 1964

and December 1979. On April 18, 1980, Zimbabwe conducted its first elections under the supervision of British and the Commonwealth. Robert Mugabe of ZANU-PF was elected as the first Prime Minister of Zimbabwe (The US Department of State, 2009/2017). The country gained an international recognition of its independence in the same year. After Zimbabwe's independence, the white population in the country declined from 250,000 to 100,000 due to immigration (Embassy of Zimbabwe, 2013). At the same time, population of white, mostly commercial farmers remained relatively constant with 4,500 farmers remaining from the original 5,000.[5] In 1980, the majority black population was given full access to secondary education. This reform rapidly increased the number of individuals continuing their schooling past primary level. The increase amounted to 53 percentage points between 1979 and 1980 (Aguero and Bharadwaj 2014).

The two political parties, which fought side by side in the independence war, did not entirely trust each other. The post-independence decade in Zimbabwe was characterized by internal instability with a Matabeleland uprising, led by Joshua Nkomo of Zimbabwe African People's Union (ZAPU), which was severely suppressed (Bratton 2011). The government ruled by ZANU-PF was responsible for execution style deaths of about 20,000 civilians in Ndebele-speaking regions in the west in the province of Matabeleland (Catholic Commission for Justice and Peace in Zimbabwe, 1997; The US Department of State, 2009/2017). In 1987, the two parties, the ZAPU and ZANU-PF, signed a peace accord and ZAPU was absorbed into ZANU-PF. Post 1987, Zimbabwe experienced a continuous decline in economic and human rights, which created an opportunity for a rise of a new opposition party, MDC, in 1999 that quickly became very popular.

[TABLE 1 HERE]

This paper focuses primarily on the period between 1999 and 2006 and employs for that ACLED (version 1) data that reports conflict events on a daily basis. Data in Table 1 could be used to separate these events into three periods: pre-MDC repression: 1997-1999, severe repression: 2000-2005 and, a period of a slow-down in repression between 2006 and 2010. The first period had 196 events reported,

[5] http://www.zimembassy.se/history.html (Accessed: July 18, 2013).

with over 65% for a given year attributed to riots and protests and between 9.1 and 22.9% of events identified as violence against civilians. Increases in food prices, student tuition and tax hikes motivated the riots. More specifically, war vets, or veterans of the independence war, complained of being left out of the compensation schemes proposed by the government, famers protested low tobacco leaf prices, students rioted about handling of the student loans and tuition, female guerrilla supporters demanded compensation for their war effort, and so forth. From 1998 and on, the reports on violent events note an increased brutality of the police. Thus, the ACLED data indicate that a period of heightened political activity preceded the 2000 referendum on the draft Constitution that was defeated.

In 1999-2000, the ACLED data notes again a fair number of protests organized by war-vets and their supporters, who felt left out of the compensation schemes for war effort, proposed by the government. During that period, the government sponsored the idea of the Fast Track Land Reform (FTLR) where land was proposed to be redistributed without compensation to landholders. This proposal was triggered by the refusal of the British government to abide by the Lancaster House Agreement, signed on December 21, 1979, originally recognized the creation of the Republic of Zimbabwe and, established provisions to set aside funds to buy out land from white farmers and redistribute it. This refusal motivated ZANU-PF to promote the idea of land reform without compensation to white farmers. This proposal was introduced in the draft constitution that was voted on in 2000 referendum, where "the government has revised the constitution and amended legislation in order to allow it to acquire commercial farms compulsorily and without compensation" (Human Rights Watch, 2012). Land redistribution became a campaign promise for ZANU-PF, carrying over from the independence struggle during which the land movement and the sentiment for it was strong.

The rise of the opposition party in 1999 and its success in mobilizing voters against the draft constitution was a direct threat to the ZANU-PF electoral dominance. To ensure political survival, and since it had promised uncompensated land reform, ZANU-PF took advantage of sentiments in some segments of rural populations and among war veterans to sponsor violent farm invasions.

During the events in the post 2000 referendum time and the start of the Fast Track Land Reform, the government also allegedly allowed land grabs by war veterans and other supporters of Mugabe's regime to compensate them for their loyalty in the independence war and beyond (Godwin 2010). Numerous farm seizures, attacks on commercial farmers and farm workers led to widespread displacement and disorder. Many grocery chains in Britain broke their contracts with commercial farms, as deliveries were not possible to ensure and to protest the violence (Rodgers 2012).

Table 1 shows the distribution of events in ACLED database by year and event type over 1997-2010. The proportion of riots in the dataset has decreased from about 90% in 1997 to less than 3% in 2000 and remained low until 2005-2007, when the proportion of riots rose to about 20% of all events. Between 1997 and 2004, violence against civilians rose dramatically from nine percent in 1997 to 83 percent in 2000 and then to over 90% of all events between 2001 and 2004. The proportion of violent actions towards civilians decreased in 2005-2007, and at the same time when the proportion of riots went up. Other types of events, such as non-violent activity, non-violent transfer of territory and headquarters/base established constituted a rather small proportion of the total number of events in ACLED database.[6]

While the ACLED count of the events in 2000 is substantial in comparison to the preceding years, the ACLED data may underestimate the actual number of events. For example, Kriger (2005) notes that only in first half of 2000 there were more than 200,000 violent events for the 12 million of the population. Between February and June of 2000, about 1500 white-owned commercial farms were invaded (Kriger 2000). By 2003 the number of large scale farms declined by 8-fold from 4,000 to 500 (Orlet 2005). Farm invasions continued through the mid-2008 and by then almost 90 percent of "white owned commercial farms were occupied or appropriated for redistribution" (Hammar 2008: 427).

[6] We also mapped the ACLED events at the year-province level for the period under observation: 1997-2006, generating 10 maps, one per year (See Appendix A: Figures A1-A10). Zimbabwe is divided into 10 provinces including the cities of Harare and Bulawayo. The maps visually suggest that the number of conflict events across the country sharply increased after the year 2000, the year of the referendum that also marked the start of the controversial land reform, the Fast Track Land Reform Programme (FTLRP) that involved widespread violent invasions of commercial farms (HRW 2002, Bratton 2011).

Hammar (2008: p. 431, endnote 21) estimates that the displacement of 150,000 to 250,000 farm workers could be attributed to the official FTLRP. Violence was not limited to farm invasions in 2000. Opposition supporters also experienced violence in the periods leading to 2000 and 2002 elections. Victims of violence included not only opposition party supporters and white farmers but also black farm workers at the white farms and bystanders who were collateral damage.

Violence that followed the 2000 February referendum and the June 2000 election was the most severe in urban localities. The urban poor who largely voted for the MDC (Movement for the Democratic Change) were targeted by the ZANU(PF) affiliates, the army and the police. A large number of events reported in ACLED database are consistent with the definition of political repression as "disappearance, detention, torture, and political killings" (conceptualized by Henderson, 1991). Further, "political repression is the use of threat of coercion in varying degrees applied by government against opponents or potential opponents to weaken their resistance to the will of authorities (Stohl and Lopez 1984, p. 7)." (as quoted in Henderson 1991, p. 121).

Agricultural and industrial production during this period fell dramatically. While a large proportion of agricultural land was given to the smallholder farmers, most of them did not have sufficient means to invest in agricultural production and were not given clear property rights to the land (Hammar 2008: p. 425, also ft. 19) that prevented them from borrowing from banks and using land as collateral. Further, the ZANU(PF) government officials claimed a sizeable proportion of seized land but often did not commit to commercial farming (Hammar 2008). Appendix B provides a timeline of important events between 1998 and 2008 in Zimbabwe's political history.

A report by Zimbabwe Institute (2007) describes the economic performance of Zimbabwe since 2000 as "disastrous". The production of major crops that were favored by communal farmers fell 1/3 to 1/2 against the target output over 2000-2006 with the sharpest decline between 2001 and 2002. Between 1998 and 2006 the cumulative decline in Zimbabwe's GDP was 37% compared to 40% gain for other African countries. Between 2001 and 2005, the country also experienced de-industrialization, there the manufacturing volume declined by 33%. The disinvestment in agriculture was also remarkable, as

infrastructure crumbled due to stealing and destruction, and due to inability to secure loans by new farmers who did not have titles to land.

3. Data and Estimation Approach

The sharp increase in the state-led violence and political retributions, violence against MDC supporters, large-scale farm invasions, displacement of agricultural workers and the ensuing collapse of agriculture, international embargoes and the economic crisis, - all predict a large fall in nutritional standards in Zimbabwe. However, the aggregate data from WHO presented in Figures 1 and 2 show rather minor changes in the height-for-age z-scores of children between 1999 and 2005/06.

Therefore, a detailed analysis of individual child nutritional status is required to quantify the effects of political crisis in Zimbabwe on child health. For that, I use two datasets, the 1999 and 2005/2006 ZDHS. The 1999 data were collected between August and November 1999 and the 2005/2006 ZDHS was fielded between August 2005 and March 2006 (Central Statistical Office and Macro International Inc. 2000, 2007). These datasets are the part of the worldwide data collection effort by MEASURE Demographic and Health Surveys (DHS+). The surveys collect information on maternal and child health, fertility, mortality and HIV/AIDS. Both surveys provide anthropometric information for children aged 0-59 months at the time of the survey. The descriptive statistics for main variables used in the analysis, such as height for age z-scores, characteristics of mother and head of the household presented in Table A1.

Height for age z-scores (HAZ) is our main measure of child health. HAZs are calculated following the World Health Organization (WHO) procedure. The z-score is defined as the difference between the child's height and the median height of the same-aged international reference population, divided by the standard deviation of the reference population.[7]

[7] Height-for-age z-scores for children are calculated using WHO Multicenter Growth reference datasets and the WHO Anthro (version 3.2.2 January 2011) STATA routines (http://www.who.int/childgrowth/software/en/). We drop the observations with biologically implausible z-scores (that is, more than 6 standard deviations away from the international reference population) from the analysis.

We also use stunting as an additional health outcome to understand whether reduction in HAZ scores corresponds to malnourishment. A child is considered to be stunted if his/her height for age z-score falls below –2 standard deviations from the WHO Child Growth Standards median (WHO 2010). The percentage of children with a low height for age (stunting) reflects the cumulative effects of undernutrition and infections since and even before birth, and it could be "interpreted as an indication of poor environmental conditions or long-term restriction of a child's growth potential" (WHO 2010: 1).

Figure 3 provides a comparison between children's HAZ by age in months and survey. In both surveys, HAZ rapidly declined during the first 18 months of life, a pattern consistent with growth faltering hypothesis (Victora et al. 2010). However, HAZ declined at a slower rate and recovered at a much faster rate for children surveyed in 1999 than for these surveyed in 2005/2006.

One of the potential concerns with cross-sectional survey data covering multiple periods is data comparability over time. Thus, to examine the sample composition over time, we regress the main control variables on the dummy for an observation coming from the 2005/2006 survey, a measure of conflict and their interaction, with and without province fixed effects (Table A2). The regression coefficients on the interaction terms suggest that in 2005/2006 in more affected regions, household heads were older, and more likely to be male. Mothers of young children were older, less likely to be Christian, and more likely to report no religious affiliation. To decrease concerns of selective targeting of individual populations and thus, the impact of their characteristics on child health, we control for these characteristics in our estimations.

To identify regional exposure to conflict these surveys are combined with the ACLED province-specific data on conflict events that are aggregated by year and province. Between 2000 and 2005, between 43 and 935 events were reported per province, with an average of 444 and a standard deviation of 394 events. The largest number of events was recorded for Mashonaland Central Bulawayo (307) and

Harare, a country's capital (935 events).[8] To reduce the relative weight of the outliers, we use a natural logarithm of the number of violent events in a province/year as a measure of conflict.

Baseline Specification

Figure 4 suggests that the length of exposure to conflict is an important determinant of child health as a greater impact is being observed for older children. Therefore, the baseline regressions include months of life exposed to conflict (age in months for kids in 2005/06 survey) as a linear measure of conflict exposure and two non-linear measures – exposed between 0 and 24 months, and exposed longer than 24 months. These measures are consistent with the ones used in the literature. Similar to Bundervoet et al. (2009) and Minoiu and Shemyakina (2014), the baseline estimation equation is given by:

$$(1) \qquad HAZ_{ijtm} = \alpha_j + \delta_t + \mu_m + \beta_1 \, Affected\ region_j * Exposed\ cohort_{ijtm} + \beta_2 * Exposed\ cohort_{ijtm} + \varepsilon_{ijtm}$$

where HAZ_{ijt} is the height-for-age z-score of child *i* (aged 0-59 months) residing in province *j* and born in year *t*; α_j are province (department); δ_t are year of birth and μ_m is age in months fixed effects. ε_{ijt} is a random, idiosyncratic error term. All regressions include indicator variables for child's gender and rural residence.

The "Exposed Cohort" variable is equal to age in months for children measured in 2005/06 survey and is zero for children observed in 1999. This linear measure stands for exposure of children at a young age to the drastic increase in violence that followed the 2000 referendum. Next, we replace "age in months" with two dummy variables that account for child being exposed for conflict events for 0-24 (based on the date of birth) months and for over 24 months. We expect to see a greater impact of violence on the health of the older cohort that was born soon after the start of the FTLR and increase in violence.[9]

[8] Omitting Harare, the capital of Zimbabwe, from the sample of 10 provinces, reduces the province/year average to 135.53, with a standard deviation of 76.76.(ACLED version 1: 1997-2009/2010).

[9] Scoones et al. (2010) suggest that the land reform eventually had a positive impact on well-being of small landholders. However, this study focuses on the impacts of political and often state led violence in 2000-2005, in the early years since the start of the Fast Track Land Reform.

"Affected region" is the province of exposure to conflict based on ACLED data (natural logarithm of number of events in a province/ department in period 2000-2005)).

In Eq. 1, the main coefficient of interest β_1 captures the average impact of residing in a region more exposed to the conflict on the health of children in the conflict-affected cohort. The inclusion of province fixed effects allows me to account for unobserved time-invariant factors that are constant across individuals within a province and that may be systematically related to exposure to the conflict and hence bias the coefficient of interest. Year of birth fixed effects control for underlying trends that affect health of each cohort in a similar manner. Age in months fixed effects control for age specific developments in child health.

It is possible that the effect of political violence varied for urban and rural locations. In urban locations, population and in particular MDC supporters were targeted for violence; while in households in rural areas suffered from political violence as well as the disruptions in the access to land and changes in work arrangements due to the agricultural reform and associated with it in Zimbabwe violence and disruptions. Therefore, we estimate all regressions for the full sample and rural sub-sample.

4. Empirical Results

4.1 The effect of conflict on child health: baseline regressions

Table 2.1 reports the baseline results where we explore the effect of the duration of exposure to conflict measured by age in months in 2005/2006 survey on child health. All regressions include age in months, year of birth and department of residence fixed effects. In Models 1-5 estimated for the full sample, the estimated coefficient of interest is negative at -0.003 and statistically significant at the 10 percent level. The value of the coefficient suggests that a child from the exposed cohort who experienced an average level of violence at 27.97 months, and who lived in a province with a median level of violence

during that period (202 events) had a HAZ that was lower by 0.4456 (= 0.003*27.97* ln(202))[10] standard deviations compared to a child from a non-exposed cohort. This estimate is comparable to Bundervoet et al. (2009) and Minoiu and Shemyakina (2014). Since the effects of land reform, commercial farm invasions and displacement of agricultural workers were more likely to be felt in the rural areas, the regressions are also estimated for the rural sub-sample. In Models 6-10 for the rural sub-sample the estimated coefficient of interest is higher in absolute value at -0.005 and is statistically significant at the 10% level in all specifications.

[TABLE 2.1 HERE]

The estimated coefficient on "Female" dummy variable (not reported) is positive and statistically significant in all of the estimations, which is consistent with other studies. The coefficient on "Rural" dummy variable is negative in most of the regressions but not statistically significant in models that include controls for household assets, suggesting that household's asset endowments' may have protected children from the effects of the crisis.

[TABLE 2.2 HERE]

In Table 2.2, we use an alternative measure of child health, or stunting as defined above. From the main model regression results, reported in Table 2.2 for the full sample and for non-migrant subsample, I find a positive and statistically significant effect for being exposed to conflict events and months of exposure on child being stunted in his or her growth only for the rural sub-sample for both, full and non-migrant sub-samples. The size of the estimated coefficient is rather small. In Col 6, the estimated coefficient is 0.000949. It suggests that for an average level of exposure to conflict at 27 months and with median number of conflict events at 202, a child in a rural location will be 14.09 percentage points (0.000949*27.97*ln(202)) more likely to be stunted than a child in the same location with 0 months of

[10] 0.003 is the estimated coefficient on the interaction term between variables "Number of months child was exposed to a violent events during his/her lifetime" and the "natural logarithm of the total number of conflict events between 2000 and 2005" in a province of child's residence (Table 2.1, Column 1). 27.97 is the average number of months a child was exposed to the conflict. 202 is the median number of conflict events a province experienced between 2002 and 2005.

exposure to conflict events. Thus, it appears that a decline in HAZ is severe enough to cause stunting in children residing in rural areas.

[TABLE 3 HERE]

In Table 3, a linear measure of child's conflict exposure is replaced with two dummy variables for "exposed for 1-24 months" and "exposed for at least 25 months". This analysis tests for the effect of the timing of exposure, as the severity of events was the highest in the early years of conflict, in 2000-2002. Therefore, the older cohort of children born after 1999 should have accumulated a greater loss in their stature compared to the younger cohort. Table 3 results support this hypothesis for the rural sub-sample. The results presented in Col. 6-10 suggest that indeed, children who were exposed to the conflict for at least 25 months and above in the more affected provinces in rural locations experienced the greatest loss in their stature. The estimated coefficient ranges between -0.235 and -0.250 depending on the set of controls considered and is statistically significantly different from zero at the 5% level. The value of the coefficient suggests that children exposed to conflict for at least 25 months in rural provinces with the median exposure conflict level have a HAZ lower by about 0.242*5.31*1 = -1.285 standard deviations.

A potential threat to the validity of our estimates is selective migration. It is possible that poorer households are more likely to migrate during conflict (e.g. Pivovarova and Swee 2012). In this case, the full sample results may underestimate the effects of conflict as poorer households may also have less healthy children. On another side, if households that place a higher preference on the health of their children are more likely to migrate out of conflict areas, our results may be overestimating the impact of conflict. To control for migration, I use information on mother's migration and re-estimate our two baseline models for the sample of mothers who did not migrate during child's life (Tables 2.1 and 3, Panel B). The results on the main coefficients of interest are very similar for the full sample results in

Tables 2.1 and 3 (Panel A) suggesting that health of non-migrant children was affected in a similar way as the health of full sample, and that migration was not one of the confounding factors.[11]

We further explore the gender-specific differentials in Tables A3 and A4 by adding to the baseline equation an interaction between "Female" dummy variable, "Exposed cohort" and "ln(events)", while controlling for other relevant interaction terms. In Table A3, the estimated coefficient on the triple interaction term is negative and statistically significantly different from zero at the 5 percent level, suggesting that female children from the affected cohort and in more affected communities fared worse. In the rural subsample, the main interaction term "ln_events* months of exposure" is negative and statistically different from zero at the 10 percent level supporting results in Table 2.1.

Table A4 tests for the non-linear effects of exposure to the conflict. The full sample estimates suggest that older female children suffered a greater loss in their stature post reform. In Columns 1-5, the estimated coefficient on the triple interaction term between "female", "exposed for at least 25 months" and "ln(events)" is negative and statistically significant at least at the five percent level. The results for the rural sub-sample in Columns 6-10 suggest that negative impacts of the conflict were the most strongly felt by all children, who experienced conflict for at least 25 months of their life and who lived in rural provinces with more violent events, which is similar to Table 3 findings.

Taken together, these results suggest that households in rural areas were not able to protect both, boys and girls, from the violent shocks that started in early 2000, as these events appear to have uniformly affected all young children aged 0-59 months at that time. The full sample results suggest that older girls in more affected locations (in urban areas, results not shown) experienced greater setbacks to their health compared to younger girls, and boys from both age groups.

These results confirm the importance of the substantial violent shock experienced by the cohort born soon after shifts in local politics starting with the 2000 referendum in Zimbabwe. The number and proportion of violence against civilians substantially increased between 1999 and 2000 (Table 1) and

[11] I also estimated the set of regressions using an alternative measure of mother's migration: a mother is considered not to have migrated if she resided in the area prior to becoming pregnant with this child. The estimation results are very similar to these in the main regression Table 2.1.

Appendix Figures A1-A10. It is possible that decline in access to food contributed to poorer child's health, as ACLED reports are heavier in farm attacks and invasions between 2000 and 2002, and these attacks, that wrecked communities and livelihoods, coupled with a subsequent decline of commercial agriculture that led to a decrease in food supply for all.

4.2. Results for Different Sub-Samples

This section explores the differential effect of this conflict on various population subgroups. We divide the sample into sub-samples: girls and boys; urban and rural; mothers with and without education and by poverty status. Household is defined as "poor" if it has less than the province-specific average amount of assets. Table 4 presents these baseline models with linear (Panel A) and non-linear measures (Panel B) of the duration of exposure to conflict. The results in Panel A suggest that the health of the following groups who lived in regions more affected by violence was particularly negatively impacted by conflict. First, girls in areas exposed to more violence experienced greater setbacks in their health than girls in areas exposed to fewer violent events or not exposed to it. Then children from rural households living in communities exposed to violence suffered more compared to children from similar communities with lesser exposure to violence, children from poor households in the more affected communities and children of mothers with some education suffered greater setbacks in their health. A greater regional exposure to conflict did not have a significant impact on health of children from urban areas, boys, and children from non-poor households. Panel B presents the baseline results with non-linear measures of duration of exposure: dummy variables for being-exposed for less than 24 months and for more than 24 months. The regression results are consistent with Panel A, albeit there are few statistically significant results. Older children from rural areas were at disadvantage if their community experienced more conflict.

[TABLE 4 HERE]

4.3 Robustness Checks

4.3.1 Selective Mortality

A potential threat to the validity of our baseline estimates is selective mortality of boys who tend to be biologically weaker in early years or girls due to gender bias as documented in studies on South and East Asia (e.g. Das Gupta 1987, Duflo 2012). To explore potential selective mortality by gender, we construct a set of province and year of birth specific sex ratios and regress them on the interaction between a dummy for an observation coming from the 2005 survey (conflict cohort) and ln(events), a 2005 survey dummy and the ln(events). The estimated coefficient on the interaction term is negative in some regressions but not statistically significantly different from zero in the four specifications considered (Table 5). The estimated coefficients on the conflict cohort dummy (survey 2005) or the province level measure of conflict are not statistically significant as well in any of the models. These results suggest that selective mortality among boys or girls did not play a significant role.

[TABLE 5 HERE]

An alternative way to explore selection mortality among cohort born after 1999 as compared to cohort born before that would be to use Census data or to use birth history data from the ZDHS data. However, we do not have access to Census data for this study; and the ZDHS based birth history data are likely to be of a limited use due to migration of population out of their communities and the country.

4.3.1 Alternative Baseline Cohort: pre-conflict instability

Further, we test for the robustness of the results to the alternative control group following approach in Minoiu and Shemyakina (2014). From Table 1, we can see that many more violent events were recorded for 1998 compared to 1997 and 1999. More specifically, in 1998, there were multiple riots motivated by the increase in food (January) and fuel (November) prices, and tax reforms.[12] There were also first

[12] The increases in food prices and tax hikes should have affected the real incomes of the population: effectively reducing them. Riots that are associated with these events in 1997 occurred before the increase in violence starting in 2000 and on that is of the main interest in this paper. Thus, the decrease in income due to higher prices and taxes

instances of farm occupations during that time (Sadomba, 2008). Therefore, we exclude from the control group (1999 survey sample) children born in 1998 and 1999 (after January 1998) as they were exposed this early period instability, and food and fuel price hikes that may have negatively affected their outcomes, biasing our baseline results towards zero. This alternative control group includes only children born between 1994 and 1997 and surveyed for the 1999 DHS. Results in Table 6 confirm our baseline results with respect to the sign and size of coefficients. We could also observe that removing from the control group all children born after January 1998 (up to the date of the 1999 survey) increases the effect size. The absolute value of the coefficient estimated on the interaction between "months of exposure" and severity of conflict (Panel A) is higher (-0.004) as compared to full sample results (-0.003) in Table 2.1, Panel A. The estimated coefficient is statistically significant at the one percent level in all of the estimations compared to 10% significance level in Table 2.1, Panel A. The estimated coefficient on the non-linear exposure (exposed for 25 months and above) and the regional conflict exposure is higher than the one in Table 3 (full sample results) and is statistically significant at the one percent level for older kids (Panel B) and is negative and statistically significant at the ten percent level for children exposed for 24 months or less. For the rural sub-sample the coefficient for older children * ln(events) is statistically significant from zero at the one percent level in all models but one and is comparable in size to the results in Table 3 Panel A.

[TABLE 6 HERE]

These results suggest that pre-2000 conflict turbulence and the increase in food prices (proxied by the increase in riots) put at a substantial disadvantage children born in 1998, the disadvantage that could be compared to the impact of political violence that substantially rose starting in 2000 and affected the whole country. Researchers have to pay close attention to the history of conflict in a country to be better able to attribute change in child health to specific periods of political disturbances.

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would have especially impacted children born in 1997 and 1998. We assume that these events applied uniformly across the country.

4.3.2 Operation Murambatsvina: alternative treatment group

In May 2005, the government carried out "Operation Murambatsvina" (translated as "Drive out the Rubbish") officially "Operation Restore Order". The official goal was to clean up the urban slums and generate urban renewal. The government bulldozed and de-legalized settlements in the cities and resettled large numbers of rural residents. Many residents were forced to destroy their own houses. Some accounts suggest that young children, elderly and the disabled were killed in the process (Hammar, 2008: p. 427). The numbers of displaced during the Operation Murambatsvina range from 120,000 (police accounts) to 323,385 (Zimbabwe Human Rights NGO Forum, 2005). About 2.4 million individuals were affected by the campaign (Tibaijuka 2005). The campaign also led to 700,000 million unemployed. As destroyed housing included a lot of informal sector production sites and workshops containing tools and other means of production, people living in these areas were also deprived of their livelihoods. This large displacement of population and loss of livelihoods could have affected child health negatively, leading to the overestimation of the effect of political violence during the 2000-2005 period. To test for that, we trim the exposed cohort (these surveyed in 2005/2006) and remove from the sample children born after May 2005.

[TABLE 7 HERE]

The estimated results are reported in Table 7. They suggest that the impact of exposure to political violence on children health outcomes was significantly different from zero for children residing in rural areas. The main coefficient of interest is stable for the full sample results and similar to Table 2.1, but the estimates are no longer statistically significantly different from zero for the rural sub-sample. While the regression coefficient is still negative, it is no longer consistently different from zero in all of the estimations. These results suggest that the political violence over the whole period between 2000 and 2005 had a substantial effect on health of children in rural areas, and the alternative treatment group estimations suggest that effects of Operation Murambatsvina may have been felt stronger in urban locations.

4.3.3 Placebo Test

Our analysis may be vulnerable to two additional concerns. The first one is that the estimated impact of the conflict captures pre-existing differences in child health between conflict and non-conflict regions. The second concern is that political violence in the country and displacement of agricultural workers may have led to out-migration of population that was affected by the violence in 2000-2005, and this wave of migration affected our sample composition. To alleviate these concerns, we follow Minoiu and Shemyakina (2014), and use household- and individual-level data from the 1994 and the 1999 Demographic and Health Surveys (DHS) for Zimbabwe for a placebo test. The children surveyed in 1994 and most of children surveyed in 1999 were not affected by the pre-conflict turbulence as well as by post 2000 conflict events. There is a caveat to the analysis. The 1994 ZDH survey only collected data on the anthropometric indicators of children less than 36 months old (DHS Program 1995). Therefore, to perform a placebo test using the combined data for 1994 (assumed control group) and 1999 (assumed treatment group) ZDHS, I estimate two sets of regressions. First, I use only the sample of children ages 35 months and below from ZDHS 1994 and 1999 (Panel A). Second, I estimate the same set of regressions for a sample of children under 35 months using the combined 1999 and 2005/2006 DHS data. The results show that children in the placebo-conflict regions and the placebo war cohort did not have different height-for-age z-scores compared to children of similar age outside placebo-conflict regions (Table 8: Panel A). In Panel B we could see that children aged 35 months or less in rural locations experienced significant health set-backs in provinces with more conflict events. Thus, the placebo test results suggest that pre-existing differences in child health across provinces differentially affected by political violence in 2000-2005 are unlikely to drive our baseline results.

[TABLE 8 HERE]

4.3.4 Potential Threats to Validity

There are several potential threats to the validity of results presented in this paper. The first one is migration. If political violence led to large displacement of the population and in particular, migration outside of a country's borders it is likely to affect results. If migrants are poorer and more likely to be

from rural locations (the correlated of poorer health outcomes above), then the regression results underestimate the impact of political violence on child health because of the selection. If the migrants are better off and from urban locations, we may expect that the obtained results are overestimating the impact of political violence on child health.

The second potential threat to the validity of our results is if political violence had a nationwide effect, in this case, all children in the affected cohort will be impacted by the health shock; and the regional impact of violence would be underestimated. From Table 2.1 though we could see that the cohort level effect of political violence on child health is not statistically significantly different from zero in most of the estimations, be it rural or full samples. We see some age specific impacts in Table 3 where the affected cohort is split into two sub-samples, but it is only true when "exposed over 25 months" dummy variable is interacted with ln(events) in the child's province of residence. Thus, we could argue that the impact of political turbulence was indeed more eminent in the areas that experienced more of political activity.

The third potential threat to the validity of our estimates is that the conflict variable is measured at the province level – a rather coarse measure. This estimation could lead to a measurement error, where some parts of the region that are geographically far away from the actual location of the conflict are included in the "conflict area" on par with the areas right next to this particular event, and this inclusion may lead to attenuation bias, or bias the regression slope towards zero.

Most of the threats to validity discussed above suggest that it is more likely that our results present a rather conservative measure of the actual impact of political violence on population.

4.3.5 Violence Impact Mechanisms

It is important to understand the mechanisms through which exposure to political violence and conflict affects child health because it may help us to develop policy responses to address these negative effects. As often, for the conflict-affected countries (e.g. Akresh et al. 2011), we are unable to explore these

mechanisms empirically, and we use anecdotal and contextual evidence from the field to speculate on the mechanisms through which political violence affected child health.

One of the potential mechanisms through which political violence could affect health of children is by influencing their families' access to resources. Several reports argued that opposition supporters were discriminated in their access to distribution of food at controlled prices and food for work programs during the crisis (e.g. Beaumont 2002; HRW, 2003; US Department of State 2009/2017). This study finds that children in rural areas who were exposed to conflict for more than 25 months of their life were negatively affected. As we are unable to identify the political affiliation of children's families, our results could be interpreted as a lower bound estimates for children of the opposition supporters. Furthermore, we could argue that the discriminatory policies of Mugabe regime had a spillover effect on everyone in the country, and what we are seeing is the average impact. Furthermore, Murambatsvina policy that led to displacement of large numbers of urban and rural residents also led to a loss by them of their livelihoods as dwellings, workshops were bulldozed, and people lost housing and their tools of trade (Sadomba 2008; US Department of State 2009/2017).

Political violence in Zimbabwe and government's focus on displacing the opposition supporters and supporters of land movement and war veterans (Sadomba 2008), and FTLR that led to displacement of large number so of farm workers led to large population displacement. Involuntary migration and longer displacement will make children exposed to water and vector borne diseases (Akresh et al. 2011). This exposure to additional diseases will explain why children affected by political violence have a shorter stature than non-affected children do in our sample. Similar to Akresh et al. (2011) we would expect this effect to be larger the longer are children exposed to the conflict and we can see the support for that from Table 3, for the rural sub-sample results, where children exposed to conflict for longer in conflict exposed areas suffer from greater health setbacks.

We could also see that girls, rural kids and children in poorer households in more affected areas were more impacted by the political violence. We could argue here that households in urban areas and from better off backgrounds were more prepared to withstand the shock, possibly indicating that the

shock was seen as forthcoming or that they had a greater access to diversity of resources and ways to secure their livelihoods.

Further research is needed to focus better on the specific mechanisms impacting children's health in this situations of prolonged deprivation, when government assistance is poor or when the government does not have the best interests of its people at heart.

5. Discussion and Conclusion

The results of this study that focused on the period of severe political repression and the start of land reform that decimated commercial farms in Zimbabwe are largely consistent with the literature on countries that experienced full-fledged civil wars (e.g. Bundervoet et al. 2009; Akresh 2011, 2012; Minoiu and Shemyakina 2014). An average civil war lasts between 5-7 years (Collier et al. 2003), which is similar in length to the five-to six year period of conflict in Zimbabwe that this study is focused on. The human toll is on an average much larger in civil wars compared to this particular incident of political repression, with number of deaths totaling 152 fatalities for 2000-2005. However, the similarity of the impacts on child health across these studies is important as it indicates that populations of countries governed by repressive regimes may suffer in similar ways to population in countries affected by civil wars, and thus, may require similar forms of international assistance. According to the WHO (1997), "growth assessment serves as an indirect measure of the quality of life of an entire population". Thus, child health as measured by height for age z-scores is an indirect measure of household's well-being. A study by Kuku et al. (2011) that uses self-reported food security measures by children and adults in Zimbabwe suggests that young children, ages 6-9, in poorer households were better protected than adults from food insecurity, with the exception of female orphans. In our study, anthropometric measures show that older children in regions more affected by violent events have lower height for age z-scores in the full sample in more affected location and stunted in rural locations. Therefore, it is likely that the health of adults in the affected areas is also distressed.

Moreover, shocks to child's early health are likely to profoundly affect children through their whole life unless mitigated by improved circumstances. From a policy perspective, it is important to identify at what age children are the most vulnerable to the shortfall in their growth and how to address this shortfall with timely policy interventions. Further, it is important to understand which factors or circumstances mitigate one's exposure to violent shocks, be it education, family income or location; and to identify the pathways through which conflict may affect one's health. This study shows that older children from rural households, female children in areas more affected by conflict, children of more educated mothers and from households with fewer assets experienced poorer health outcomes. With respect to the conflict mechanisms, we were able to explore the one that frequently affects households in conflict-affected countries, namely migration. We find very little difference in the magnitude of estimated coefficients between the full and non-migrant sub-samples for full sample results, while rural migrant children experienced poorer health outcomes in the location where they moved to (results not reported), suggesting that health of migrant children was affected similarly to the full sample. Furthermore, we would like to qualify that our results are contingent on an individual surviving the conflict and remaining within the country borders.

References:

Aguero, J. M. and P. Bharadwaj. 2014. "Do the More Educated Know More about Health? Evidence from Schooling and HIV Knowledge in Zimbabwe." *Economic Development and Cultural Change* 62(3): 489-517.

Akresh, R. and D. de Walque. 2010. "Armed Conflict and Schooling: Evidence from the 1994 Rwandan Genocide," IZA Discussion Paper.

Akresh, R., Verwimp, P. and T. Bundervoet, 2011, "Civil War, Crop Failure, and Child Stunting in Rwanda," *Economic Development and Cultural Change*, 59(4), pp. 777-810.

Akresh, R., Lucchetti, L., and H. Thirumurthy, 2012, "Wars and child health: Evidence from the Eritrean-Ethiopian conflict," *Journal of Development Economics*, Vol. 99, pp. 330-40.

Akbulut-Yuksel, M., 2014, "Children of war: The long-run effects of large-scale physical destruction and warfare on children," *The Journal of Human Resources*, 49 (3): 634-662.

Alderman, H., J. Hoddinott and B. Kinsey, 2006, "Long Term Consequences of Early Childhood Malnutrition," *Oxford Economic Papers*, 58 (3), pp. 450-474.

Alix-Garcia, J.; A. Bartlett and D. Saah. 2012. "The Landscape of Conflict: IDPs, aid, and land use change in Darfur." *Journal of Economic Geography.*

Almond, D. and J. Currie, 2011, "Human capital development before age five," *Handbook of Labor Economics*, Vol. 4, Part B, pp. 1315-1486.

Besley, T. and T. Persson. 2011. "The logic of political violence." *Quarterly Journal of Economics* 126(3): 1411-1445.

Beaumont, Peter. 2002. "Mugabe 'starves' opponents' children." The Guardian. May 25th. World News. https://www.theguardian.com/world/2002/may/26/zimbabwe.peterbeaumont?CMP=share_btn_link

Bird, K. and M. Prowse. 2008. "Vulnerability, Poverty and Coping in Zimbabwe," *UNU-WIDER, Research Paper No. 2008/41*. Helsinki, Finland: UNU-WIDER.

Bratton, M.. 2011. "Violence, partisanship and transitional justice in Zimbabwe." *The Journal of Modern African Studies, 49*(03): 353-380.

Bundervoet, T., Verwimp, P. and R. Akresh, 2009, "Health and Civil War in Rural Burundi," *Journal of Human Resources*, 44 (2), pp. 536-563.

Central Statistical Office and Macro International Inc. 2000. Zimbabwe Demographic and Health Survey 1999.

Central Statistical Office and Macro International Inc. 2007. Zimbabwe Demographic and Health Survey 2005-06. Calverton, Maryland: CSO and Macro International Inc.

Cliffe, L.; J. Alexander, B. Cousins & R. Gaidzanwa. 2011. An overview of Fast Track Land Reform in Zimbabwe: editorial introduction, *The Journal of Peasant Studies*, 38:5, 907-938, DOI: 10.1080/03066150.2011.643387

Collier, P.; Elliott, V. L.; Hegre, H.; Hoeffler, A.; Reynal-Querol, M.; Sambanis, N.. 2003. "*Breaking the conflict trap: civil war and development policy*", Washington, DC: World Bank; [New York]: Oxford University Press.

Das Gupta, M. 1987. "Selective Discrimination against Female Children in Rural Punjab, India." *Population and Development Review*, 13(1), pp. 77-100.

Davenport, C. 1995. "Multi-dimensional threat perception and state repression: An inquiry into why states apply." *American Journal of Political Science 39(3):* 683.

Davenport, C. 2007. "State repression and political order." *Annual Review of Political Science 10*: 1-23.

DHS Program 1995. Zimbabwe: Demographic and Health Survey 1994. Central Statistical Office, Harare, Zimbabwe; Macro International Inc., Calverton, Maryland USA.

Duflo, E. 2012. "Women Empowerment and Economic Development." *Journal of Economic Literature*, 50(4), pp. 1051-79.

Giles, J., A. Park, and M. Wang. 2008. "The Great Proletarian Cultural Revolution, Disruptions to Education, and Returns to Schooling in Urban China." World Bank Policy Research Working Paper 4729.

Godwin, R. 2011. The Fear: Robert Mugabe and the Martyrdom of Zimbabwe New York: Little, Brown and Company.

Hammar, A. 2008. "In the Name of Sovereignty: Displacement and State Making in Post-Independence Zimbabwe." *Journal of Contemporary African Studies, 26*(4), pp. 417-34.

Henderson, C. W. 1991. "Conditions Affecting the Use of Political Repression." *The Journal of Conflict Resolution. 35(1):* 120.

Human Rights Watch, 2002. *Fast Track Land Reform in Zimbabwe*, 8 March, A1401, available at: http://www.refworld.org/docid/3c8c82df4.html [accessed 7 December 2013]

Human Rights Watch. 2003. "ZIMBABWE: Not Eligible: The Politicization of Food in Zimbabwe". Report, October, Vol. 15, No. 17(A). https://www.hrw.org/reports/2003/zimbabwe1003/zimbabwe1003.pdf

Kim, Y. J. 2011. A study on the mental health of North Korean refugee youth in South Korea, Daegu University, South Korea: http://isci.chapinhall.org/?page_id=536. Accessed: November 8, 2013.

Kriger, N. 2005. "Zanu(Pf) Strategies in General Elections, 1980-2000: Discourse and Coercion." *African Affairs, 104*(414), pp. 1-34.

Kuku, O.; C. Gundersen; S. Garasky. 2011. "Differences in food insecurity between adults and children in Zimbabwe." *Food Policy* 36: 311-317.

Lahiff, E. and Cousins, B. 2001. "The Land Crisis in Zimbabwe Viewed from South of the Limpopo." *Journal of Agrarian Change, 1*(4), pp. 652-66.

Orlet, C. 2005. "From Breadbasket to Dustbowl," *The American Spectator.* April 13.

Meng, Xin, and R. G. Gregory. 2002. "The Impact of Interrupted Education on Subsequent Educational Attainment: A Cost of the Chinese Cultural Revolution." *Economic Development and Cultural Change. 50(4):* 935-959.

Minoiu, C. and O. Shemyakina, 2012, "Child Health and Conflict in Côte d'Ivoire," *American Economic Review Papers and Proceedings*, Vol. 102, Issue 3, pp. 294-299.

Minoiu, C. and O. N. Shemyakina. 2014. "Armed Conflict, Household Victimization and Child Health in Côte d'Ivoire". *Journal of Development Economics.* 108, pp. 237-255.

Moyo, S. 2000. "The Political Economy of Land Acquisition and Redistribution in Zimbabwe, 1990-1999." Journal of Southern African Studies 26(1): 5-28.

Neupert, R. F. and V. Prum. 2005. "Cambodia: Reconstructing the demographic stab of the past and forecasting the demographic scar of the future," *European Journal of Population*, 21: 217-246.

Pivovarova, M. and E. L. Swee. 2012. Quantifying The Microeconomic Effects of War: How Much Can Panel Data Help? Households in Conflict Network. Working Paper 116.

Raleigh, C.; Linke, A.; Hegre, H. and Karlsen, J.. 2010. "Introducing ACLED: An Armed Conflict Location and Event Dataset." *Journal of Peace Research*, *47*(5), pp. 651-60.

Rodgers, D. 2009. The Last Resort: A Memoir of Zimbabwe, Random House LLC. Kindle Edition.

Shemyakina, O., 2011, "The Effect of Armed Conflict on Accumulation of Schooling: Results from Tajikistan," *Journal of Development Economics*, 95(2), pp. 186-200.

Sadomba, W. Z.. 2008. “War Veterans in Zimbabwe’s Land Occupations: Complexities of a liberation movement in an African post-colonial settler society.” ISBN: 978-90-8504-917-3. Ph.D. Dissertation. “African Institute of Agrarian Studies”.

Scoones, I.; N. Marongwe; B. Mavedzenge, J. Mahenehene, F. Murimbarimba and C. Sukume. 2010. Zimbabwe's Land Reform: Myths and Realities (African Issues), Zimbabwe: Weaver Press.

Stohl, M., and G.A. Lopez. 1984. Introduction. In *The state as terrorist*, edited by M. Stohl and G.A. Lopez, 3-10. Westport, CT: Greenwood.

The US Department of State, 2009/2017. "Zimbabwe (04/09)". https://2009-2017.state.gov/outofdate/bgn/zimbabwe/122176.htm.

Tibaijuka, A., 2005. Report of the Fact-Finding Mission to Zimbabwe to assess the Scope and Impact of Operation Murambatsvina by UN Special Envoy on Human Settlements Issues in Zimbabwe, New York: United Nations. 18 July 2005.

WHO. 2010. Nutrition Landscape Information System (NLIS): Country Profile Indicators. World Health Organization 2010.

Victora, C. G., M. de Onis, P. Curi Hallal, M. Blössner and R. Shrimpton. 2010. "Worldwide Timing of Growth Faltering: Revisiting Implications for Interventions". *Pediatrics*, 125, e. 473.

Verwimp, P., 2012, "Undernutrition, Subsequent Risk of Mortality and Civil War in Burundi." *Economics and Human Biology*. 10(3), pp. 221-328.

World Bank. 2011. *World Development Report 2011: Conflict, Security and Development*. Washington DC: The World Bank.

Zimbabwe Human Rights NGO Forum. 2005. Order out of Chaos, or Chaos out of Order?: A Preliminary Report on Operation "Murambatsvina".

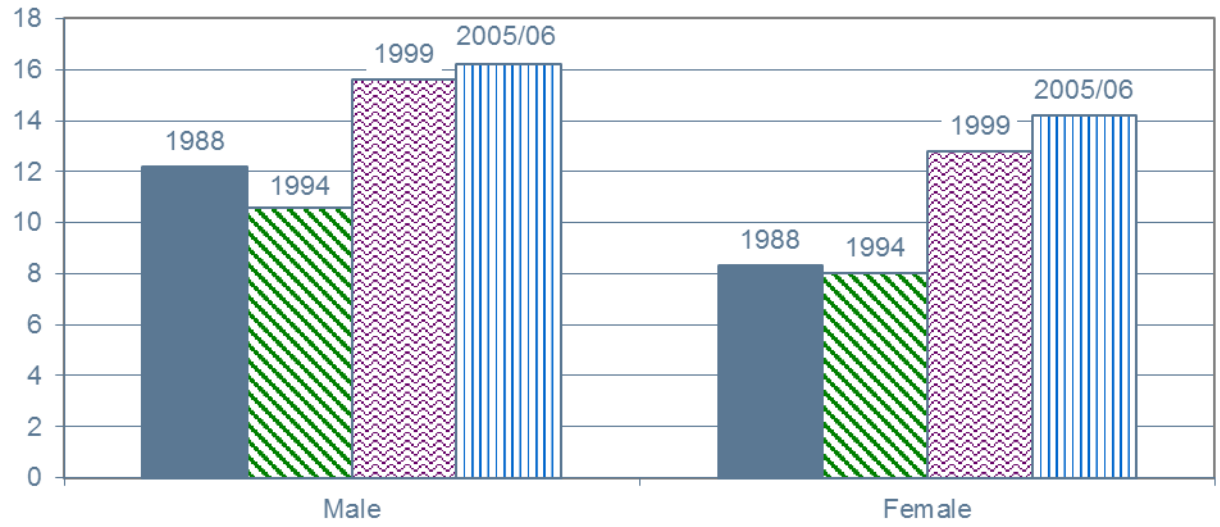
Zimbabwe Institute. 2007. Progressive Zimbabwe - Sustainable Growth and Transformation. Macro-economic Paper for Zimbabwe Institute. Accessed: March 15, 2014. http://www.zimbabweinstitute.net/File_Uploads/docs/Progressive%20Zimbabwe%20Final.pdf

[dataset] Zimbabwe Demographic and Health Survey 1994. https://dhsprogram.com/data/

[dataset] Zimbabwe Demographic and Health Survey 1999. https://dhsprogram.com/data/

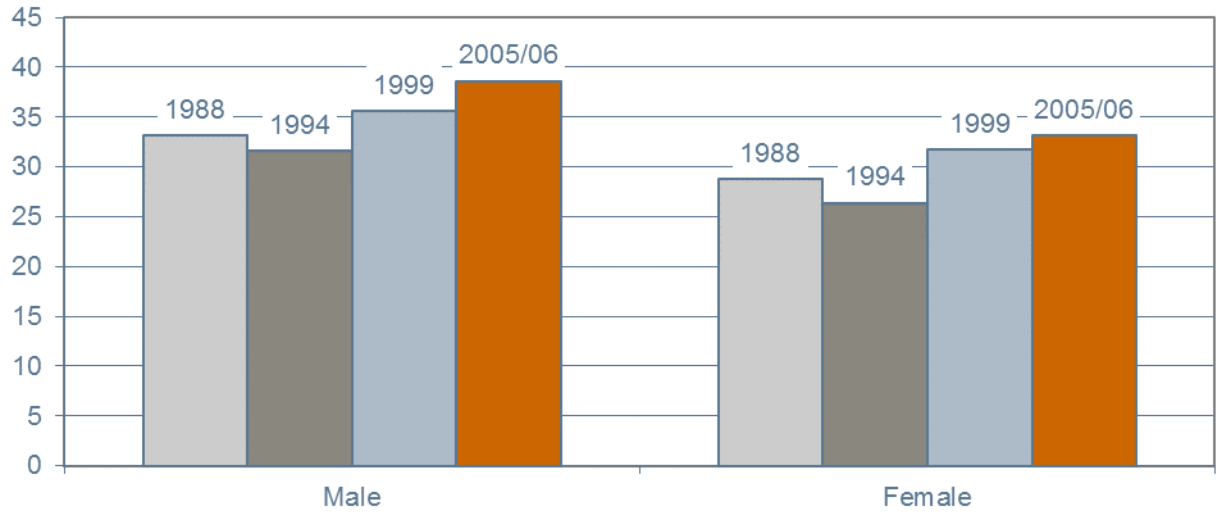
[dataset] Zimbabwe Demographic and Health Survey 2005/2006. https://dhsprogram.com/data/

Figure 1 – Percentage of children with HAZ below -3 SD by survey year.



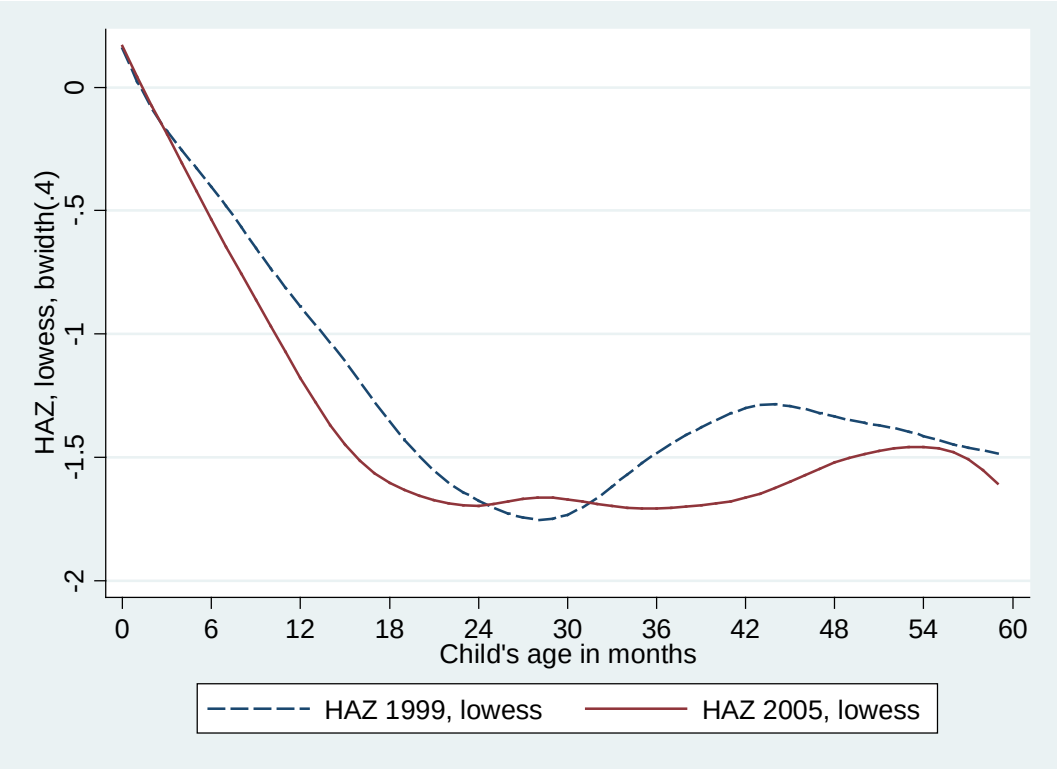
Source: WHO Global Database on Child Growth and Malnutrition. July 15, 2012. Zimbabwe. http://www.who.int/nutgrowthdb/database/countries/who_standards/zwe.pdf?ua=1
Note: All bars show the percentage of children in the relevant age group with HAZ less than -3SD. Age categories: 1988 - 0.25-5.00; 1994 - 0-2.99 and 1999 and 2005/06 – 0-5 years.

Figure 2 – Percentage of children with HAZ below -2 SD by survey year.



Source: as for Figure 1. Notes: as for Figure 1.

Figure 3 – HAZ by child's age in months and survey date



Source: ZDHS 1999 and 2005/06. Author's calculations

Table 1 – Violent Events in Zimbabwe by Year and Type of Event: 1997-2010

Type of Event	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	total
Battle-No change of territory	0.0	0.0	1.2	0.6	0.0	0.4	1.1	2.2	0.0	1.6	2.9	0.6	3.1	1.8	1.0
Headquarters or base established	0.0	0.0	0.0	10.4	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.6	0.0	15.9	2.6
Non-violent transfer of territory	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Remote violence	0.0	0.0	0.0	1.5	0.3	0.1	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.4	0.2
Riots/Protests	90.9	84.6	66.3	3.3	4.4	1.5	4.2	3.7	19.9	17.2	19.5	3.3	28.9	10.6	10.7
Strategic development	0.0	1.1	9.6	1.5	2.2	2.0	0.3	0.0	0.0	0.0	0.0	2.8	7.1	16.4	2.7
Violence against civilians	9.1	14.3	22.9	82.8	93.1	91.3	94.4	94.1	80.2	81.2	77.1	92.6	60.9	54.9	82.7
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N-events year	22	91	83	337	318	784	354	324	272	122	210	800	225	226	4,168
Fatalities per year	2	11	6	46	37	54	6	2	7	1	9	108	27	8	324

Source: ACLED data, version 7 (1997-2016), accessed 10/27/2017. ACLED data (Raleigh et al. 2010).

Table 2.1 - The effect of exposure to political violence on height-for-age z-score (HAZ), difference in differences regressions.

Panel A: Full sample	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence * ln	-0.003*	-0.003*	-0.003*	-0.003*	-0.003*	-0.005*	-0.005*	-0.005*	-0.005*	-0.005*
events	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Months exposed to political violence	0.017*	0.016*	0.016*	0.014	0.011	0.024	0.023	0.023	0.021	0.02
	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)	(0.016)	(0.016)	(0.016)	(0.015)	(0.017)
rural	-0.287**	-0.273**	-0.273**	-0.254**	-0.04					
	(0.091)	(0.088)	(0.085)	(0.096)	(0.082)					
N	6555	6555	6519	6548	6524	5023	5023	4992	5017	5003
R squared	0.11	0.11	0.11	0.12	0.12	0.13	0.13	0.13	0.13	0.13
F-values (joint test of controls)										
Interview language	na	0.030	0.049	0.067	0.188	na	0.057	0.051	0.012	0.034
Head controls	na	na	0.589	na	na	na	na	0.734	na	na
Mother controls	na	na	na	0.000	na	na	na	na	0.000	na
HH assets controls	na	na	na	na	0.032	na	na	na	na	0.013
Panel B: Non-migrant sub-sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence * ln	-0.003*	-0.003*	-0.003	-0.003*	-0.003	-0.005	-0.005	-0.005	-0.005	-0.005
events	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Months exposed to political violence	0.014	0.012	0.013	0.012	0.008	0.016	0.015	0.015	0.013	0.012
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.018)	(0.018)	(0.019)	(0.018)	(0.020)
rural	-0.318**	-0.303**	-0.304**	-0.282**	-0.095					
	(0.104)	(0.101)	(0.104)	(0.099)	(0.133)					
N	5735	5735	5707	5729	5706	4405	4405	4381	4400	4387
R squared	0.12	0.12	0.12	0.13	0.12	0.14	0.14	0.14	0.14	0.14
F-values (joint test of controls)										
Interview language	na	0.082	0.137	0.136	0.268	na	0.087	0.108	0.028	0.064
Head controls	na	na	0.892	na	na	na	na	0.427	na	na
Mother controls	na	na	na	0.010	na	na	na	na	0.002	na
HH assets controls	na	na	na	na	0.046	na	na	na	na	0.081
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes

Notes: Sample: children age 0-59 months in 1999 and 2005/2006 DHS. Robust standard errors in parentheses, clustered at the province level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is a child's height-for-age z-score (HAZ). All regressions include a dummy variable for "female" child, year of birth, age in months and province of residence fixed effects. The interview language dummies includes: Ndebele, other (English and

other) with Shona being a reference category. Mother's characteristics include: mother's age, a set of controls for mother completing: primary, secondary, higher education, and other ("no education" is a reference category), and controls for mother's religion (traditional, other, no religion, "Christian" is a reference category). Household head characteristics include: household's head age, gender (=1 if male) and an indicator for household head being literate (completed some education). Household's assets include a set of dummy variables for: having access to a toilet facility, have cement floor in a household, for cooking hhd used electricity, natural gas, or coal; household has access to electricity, phone, and a dummy for household owning a car. Data sources: DHS 1999 and 2005/2006 and ACLED v1 (Raleigh et al. 2010).

Table 2.2 -- The effect of exposure to political violence on stunting, difference in differences regressions.

	Full sample					Rural sample				
Panel A: full sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to conflict * ln	0.000051	0.000038	0.000027	0.000045	0.000034	0.000949*	0.000920*	0.000897*	0.000899*	0.000873*
events	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N months exposed to conflict	0.002034	0.0022	0.001926	0.002582	0.002889	-0.001415	-0.001282	-0.001282	-0.000901	-0.000401
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
rural	0.066763**	0.064335**	0.067861**	0.056933**	0.009087					
	(0.022)	(0.022)	(0.023)	(0.025)	(0.032)					
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes
N	6560	6560	6520	6550	6520	5020	5020	4990	5020	5000
R squared	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08
Panel B: non-migrants	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to conflict * ln	0.000121	0.000109	0.000088	0.000114	0.000077	0.001044*	0.001010*	0.000968	0.000985*	0.000942
events	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
N months exposed to conflict	0.00453	0.004779	0.004433	0.004863	0.005486*	0.001305	0.00152	0.001553	0.001859	0.002486
	(0.0029)	(0.0030)	(0.0029)	(0.0029)	(0.0027)	(0.0028)	(0.0028)	(0.0029)	(0.0027)	(0.0029)
rural	0.072916**	0.070389**	0.073288*	0.062730*	0.022727					
	(0.031)	(0.031)	(0.033)	(0.034)	(0.054)					
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes
N	5740	5740	5710	5730	5710	4410	4410	4380	4400	4390
R squared	0.07	0.07	0.07	0.08	0.07	0.08	0.08	0.08	0.08	0.08

Notes and data sources: see “notes and “data sources” to Table 2.1.The dependent variable is a dummy variable denoting a child being stunted based on WHO standards.

Table 3 – The effect of exposure to state violence on height-for-age z-score (HAZ), difference in differences regressions. Non-linear conflict exposure.

Panel A: Full sample	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Exposed 1-24 months * ln events	-0.052	-0.05	-0.054	-0.053	-0.041	-0.147	-0.144	-0.144	-0.147	-0.13
	(0.062)	(0.063)	(0.062)	(0.062)	(0.066)	(0.108)	(0.108)	(0.107)	(0.109)	(0.108)
Exposed 25 plus months * ln events	-0.111	-0.108	-0.112	-0.109	-0.099	-0.250**	-0.246**	-0.245**	-0.244**	-0.235**
	(0.070)	(0.069)	(0.070)	(0.069)	(0.071)	(0.097)	(0.096)	(0.097)	(0.096)	(0.096)
Exposed for 0-24 months	-0.435	-0.444	-0.438	-0.427	-0.494	-0.071	-0.092	-0.106	-0.073	-0.169
	(0.462)	(0.467)	(0.474)	(0.459)	(0.486)	(0.617)	(0.626)	(0.628)	(0.624)	(0.621)
Exposed for at least 25 months	-0.368	-0.386	-0.374	-0.396	-0.455	0.138	0.116	0.098	0.104	0.033
	(0.453)	(0.448)	(0.463)	(0.448)	(0.455)	(0.640)	(0.637)	(0.643)	(0.615)	(0.635)
rural	-0.256**	-0.241**	-0.244**	-0.226*	-0.005					
	(0.097)	(0.092)	(0.090)	(0.102)	(0.094)					
N	6555	6555	6519	6548	6524	5023	5023	4992	5017	5003
R squared	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10
Panel B: Non-migrant sub-sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Exposed 1-24 months * ln events	-0.043	-0.042	-0.042	-0.045	-0.027	-0.152	-0.145	-0.144	-0.145	-0.13
	(0.070)	(0.068)	(0.069)	(0.066)	(0.072)	(0.093)	(0.092)	(0.090)	(0.095)	(0.086)
Exposed 25 plus months * ln events	-0.11	-0.108	-0.108	-0.109	-0.092	-0.263**	-0.256*	-0.254*	-0.252*	-0.243*
	(0.082)	(0.080)	(0.081)	(0.079)	(0.083)	(0.110)	(0.109)	(0.110)	(0.109)	(0.110)
Exposed for 0-24 months	-0.474	-0.48	-0.483	-0.461	-0.558	-0.044	-0.079	-0.098	-0.076	-0.166
	(0.452)	(0.451)	(0.455)	(0.439)	(0.467)	(0.462)	(0.467)	(0.454)	(0.479)	(0.440)
Exposed for at least 25 months	-0.308	-0.322	-0.318	-0.327	-0.414	0.236	0.199	0.18	0.177	0.101
	(0.480)	(0.471)	(0.485)	(0.470)	(0.492)	(0.704)	(0.701)	(0.706)	(0.687)	(0.704)
rural	-0.279**	-0.262**	-0.267**	-0.248**	-0.057					
	(0.111)	(0.107)	(0.110)	(0.108)	(0.150)					
N	5735	5735	5707	5729	5706	4405	4405	4381	4400	4387
R squared	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes

Notes: as for Table 2.1. Exposed for “1-24” months and “exposed for more than 25 months” are dummy variables indicating months of exposure to political violence.

Table 4 - Impact of political violence on child health, analysis by sub-group

Panel A: linear exposure to political violence	female	male	rural	urban	mother no education	mother some education	poor	non poor
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
N months exposed to political violence * ln events	-0.005**	-0.002	-0.005*	-0.003	-0.003	-0.003*	-0.004**	-0.002
	(0.002)	(0.001)	(0.002)	(0.002)	(0.005)	(0.001)	(0.002)	(0.001)
N months exposed to political violence	0.002	-0.045***	-0.024	0.000	-0.097**	-0.019**	-0.021	-0.026**
	(0.012)	(0.007)	(0.015)	(0.017)	(0.038)	(0.006)	(0.015)	(0.011)
Female			0.207***	0.086	-0.002	0.181***	0.167***	0.183**
			(0.034)	(0.069)	(0.105)	(0.045)	(0.032)	(0.078)
rural	-0.263**	-0.280**			0.595	-0.278**	0.004	-0.228*
	(0.108)	(0.120)			(0.397)	(0.098)	(0.095)	(0.120)
N	3284	3271	5023	1532	402	6153	3390	3134
R squared	0.09	0.10	0.10	0.08	0.11	0.10	0.11	0.08
Panel B: Non-linear exposure to political violence	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Exposed 1-24 months * ln events	-0.026	-0.071	-0.147	-0.051	-0.197	-0.034	0.022	-0.062
	(0.025)	(0.109)	(0.108)	(0.039)	(0.333)	(0.065)	(0.059)	(0.145)
Exposed 25 plus months * ln events	-0.165	-0.056	-0.250**	-0.075	-0.044	-0.105	-0.147	-0.057
	(0.092)	(0.059)	(0.097)	(0.084)	(0.273)	(0.078)	(0.088)	(0.073)
Exposed for 0-24 months	0.690*	-1.293	-0.071	0.892***	2.829	-0.593	-1.385*	0.265
	(0.310)	(0.766)	(0.617)	(0.216)	(1.938)	(0.453)	(0.686)	(0.975)
Exposed for at least 25 months	1.304	-1.739**	0.138	0.942	-0.227	-0.300	-0.799	-0.037
	(0.812)	(0.681)	(0.640)	(0.600)	(1.764)	(0.415)	(1.065)	(0.471)
Female			0.214***	0.089	0.023	0.186***	0.173***	0.190**
			(0.034)	(0.069)	(0.117)	(0.045)	(0.035)	(0.080)
rural	-0.249**	-0.253*			0.61	-0.257**	0.003	-0.211
	(0.109)	(0.116)			(0.406)	(0.093)	(0.100)	(0.121)
N	3284	3271	5023	1532	402	6153	3390	3134
R squared	0.09	0.10	0.10	0.07	0.14	0.09	0.11	0.07

Notes: as for Table 2.1. “Poor” household is defined as the one with less than the province-specific average amount of assets (Household's assets include a set of dummy variables for: having access to a toilet facility, have cement floor in a household, used for cooking oil, household has access to electricity, phone, and a dummy for household owning a car). “Mother no education” – is a mother with zero years of education. “Mother some education” – mother has some years of education above zero.

Table 5 – Variations in Sex Ratios Across Regions and Over Time

	(1)	(2)	(3)	(4)
Survey 2005 * ln(events)	0.01	-0.008	0.008	-0.011
	(0.140)	(0.126)	(0.144)	(0.127)
Survey 2005	-0.043	-1.109	-0.037	-1.266
	(0.779)	(0.930)	(0.803)	(0.914)
ln(events)	0.01	0.019		
	(0.083)	(0.083)		
N	122	122	122	122
R squared	0.00	0.18	0.04	0.24
Year of birth FE		X		X
Province of Residence FE			X	X

Notes: Robust standard errors in parentheses, clustered at the province level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is the sex ratio (by province and year of birth). Sex ratios are computed from data for 6,558 children with non-missing information on gender and location of current residence from two pooled surveys. The year of birth ranges between 1994 and 2006. “War cohort” is an indicator for an observation coming from the 2005/2006 DHS. Data sources: as for Table 2.1.

Table 6 – Alternative baseline cohort, full sample, the effect of exposure to political violence on height-for-age z-scores (HAZ), difference in differences regressions.

Panel A: Linear exposure	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004*	-0.004*	-0.004*	-0.004*	-0.004*
* ln events	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Months exposed to political violence	-0.017	-0.018*	-0.018	-0.018*	-0.020*	-0.027*	-0.027*	-0.027*	-0.028**	-0.029*
	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.013)	(0.013)	(0.013)	(0.012)	(0.014)
rural	-0.382**	-0.364***	-0.363***	-0.353**	-0.150					
	(0.118)	(0.111)	(0.105)	(0.127)	(0.117)					
N	5516	5516	5488	5512	5492	4229	4229	4204	4225	4213
R squared	0.08	0.08	0.08	0.09	0.09	0.08	0.09	0.08	0.09	0.09
Panel B: Non-linear exposure	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Exposed 1-24 months * ln events	-0.103*	-0.104*	-0.102*	-0.109*	-0.096*	-0.127	-0.125	-0.124	-0.123	-0.113
	(0.048)	(0.051)	(0.051)	(0.049)	(0.052)	(0.105)	(0.110)	(0.110)	(0.114)	(0.105)
Exposed 25 plus months * ln events	-0.165***	-0.164***	-0.161***	-0.168***	-0.155***	-0.228***	-0.225***	-0.222***	-0.223***	-0.216**
	(0.039)	(0.037)	(0.039)	(0.038)	(0.036)	(0.062)	(0.059)	(0.060)	(0.056)	(0.062)
Exposed for 0-24 months	-0.185	-0.185	-0.199	-0.158	-0.229	-0.173	-0.186	-0.202	-0.204	-0.258
	(0.434)	(0.447)	(0.459)	(0.433)	(0.454)	(0.635)	(0.659)	(0.676)	(0.669)	(0.647)
Exposed for at least 25 months	-0.095	-0.109	-0.121	-0.097	-0.168	0.037	0.023	0.0000	0.004	-0.053
	(0.402)	(0.396)	(0.413)	(0.394)	(0.399)	(0.498)	(0.483)	(0.498)	(0.446)	(0.506)
rural	-0.355**	-0.338**	-0.338**	-0.334**	-0.139					
	(0.119)	(0.112)	(0.106)	(0.129)	(0.121)					
N	5516	5516	5488	5512	5492	4229	4229	4204	4225	4213
R squared	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.08
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes

Notes: as for Table 2.1. The baseline cohort (DHS 1999 observations) excludes children born after Jan 1998 (1998 and 1999 born) as they were exposed to pre-crisis events soon right after their birth.

Table 7 – Alternative treatment (affected) cohort, full sample, the effect of exposure to political violence on height-for-age z-scores (HAZ), difference in differences regressions.

Panel A: Full sample	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence * ln	-0.003	-0.003	-0.003	-0.003	-0.003	-0.005*	-0.005*	-0.005*	-0.005*	-0.005*
events	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Months exposed to political violence	0.017*	0.016*	0.017*	0.015	0.012	0.029*	0.028*	0.028*	0.026*	0.025
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.013)	(0.013)	(0.013)	(0.013)	(0.015)
rural	-0.271**	-0.258**	-0.256**	-0.238**	-0.022					
	(0.086)	(0.083)	(0.079)	(0.094)	(0.085)					
N	6137	6137	6105	6130	6106	4660	4660	4633	4654	4640
R squared	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11
Panel B: Non-migrant sub-sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence * ln	-0.003	-0.003	-0.003	-0.003	-0.003	-0.005	-0.005	-0.005	-0.005	-0.005
events	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Months exposed to political violence	0.014	0.013	0.013	0.012	0.008	0.023	0.021	0.022	0.02	0.018
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.016)	(0.016)	(0.016)	(0.015)	(0.018)
rural	-0.300**	-0.286**	-0.286**	-0.264**	-0.076					
	(0.097)	(0.095)	(0.097)	(0.093)	(0.121)					
N	5321	5321	5297	5315	5292	4045	4045	4025	4040	4027
R squared	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes

Notes: as for Table 2.1. The alternative treatment cohort excludes children born in or after May 2005 as they were exposed to Operation Murambatsvina in infancy.

Table 8 – Placebo Test: testing the parallel trends assumption.

Panel A: 1994 and 1999 ZDHS: children under 36 months old	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence (placebo) * ln events	0.001	0.001	0.001	0.001	0.000	0.002	0.002	0.002	0.002	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
N months exposed to political violence (placebo)	-0.001	-0.001	0.002	0.000	0.007	-0.004	-0.004	0.000	0.001	0.007
	(0.021)	(0.021)	(0.021)	(0.020)	(0.022)	(0.039)	(0.039)	(0.041)	(0.040)	(0.041)
rural	-0.142	-0.144	-0.139	-0.054	0.144					
	(0.106)	(0.105)	(0.094)	(0.127)	(0.113)					
N	3769	3769	3723	3769	3746	2912	2912	2871	2912	2897
R squared	0.15	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18
Panel B: 1999 and 2005/2006 ZDHS: children under 36 months old	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence * ln events	-0.003	-0.003	-0.003	-0.003	-0.002	-0.008*	-0.009*	-0.009*	-0.009*	-0.008*
	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
N months exposed to political violence	0.017	0.017	0.017	0.015	0.006	0.036	0.037	0.037	0.037	0.031
	(0.025)	(0.025)	(0.026)	(0.025)	(0.027)	(0.028)	(0.028)	(0.029)	(0.027)	(0.030)
rural	-0.294**	-0.293**	-0.299**	-0.263*	-0.042					
	(0.117)	(0.116)	(0.114)	(0.120)	(0.121)					
N	4073	4073	4050	4068	4053	3133	3133	3113	3129	3118
R squared	0.13	0.13	0.13	0.13	0.13	0.15	0.15	0.15	0.15	0.15
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes

Notes: Sample: Panel A: children age 0-35 months in 1994 and 1999 ZDHS. Panel B: children age 0-35 months in 1999 and 2005/2006 ZDHS.
In Panel A: Children surveyed in 1999 are assumed to belong to "exposed cohort"; In Panle B: children surveyed in 2005/2006 are the "exposed cohort".Robust standard errors in parentheses, clustered at the province level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is a child's height-for-age z-score (HAZ). All regressions include a dummy variable for "female" child, year of birth, age in months and province of residence fixed effects. The interview language dummies includes: "Ndebel", reference category is "Shona + other language" (the last two categories are bundled together b/se there was no "other" category reported in ZDHS 1994 sample. Mother's characteristics include: mother's age, a set of controls for mother completing: primary, secondary, higher education, and other ("no education" is a reference category), and controls for mother's religion (traditional, other, no religion, "Christian" is a reference category). Household head characteristics include: household's head age, gender (=1 if male) and an indicator for household head being literate (completed some education). Household's assets include a set of dummy variables for: having access to a toilet facility, have cement floor in a household, household has access to electricity, and a dummy for household owning a car. Data sources: Zimbabwe DHS: 1994, 1999 and 2005/2006 and ACLED v1. (Raleigh et al. 2010).

APPENDIX

Table A1 – Sample statistics

Variable	N obs, 1999	Survey=1999 (non-exposed)	N obs, 2005	Survey=2005 (Exposed group)
Child's height-for-age z-score (HAZ)	3194	-1.26	4973	-1.38
Child's weight-for-height z-score (WHZ)	3194	0.11	4973	0.09
Child's age in months	3078	27.86	4535	27.97
Child months exposed to political violence	3078	0.00	4535	27.97
Child's exposure for 0-24 months (dummy)	3078	0.00	4535	0.45
Child's exposure for 25 months and more (dummy)	3078	0.00	4535	0.54
Female child	3078	0.50	4537	0.50
Months exposed to political violence * events	3078	0.00	4535	7377.14
Months exposed to political violence * ln(events)	3078	0.00	4535	145.48
Interview language is Shona	3892	0.68	5944	0.77
Interview language is Ndebele	3892	0.30	5944	0.21
Interview language is English	3892	0.02	5944	0.00
Interview language is "other"	3892	0.03	5944	0.01
Rural resident	3892	0.77	5944	0.75
Mother's age	3077	28.11	4537	27.78
Mother has no education	3077	0.08	4537	0.04
Mother has primary education	3077	0.47	4537	0.39
Mother has secondary education	3077	0.43	4537	0.55
Mother has higher education	3077	0.02	4537	0.02
Mother practices traditional religion	3067	0.04	4537	0.04
Mother is Christian	3067	0.80	4537	0.85
Mother did not report religion	3067	0.13	4537	0.10
Mother belongs to other religion	3067	0.04	4537	0.01
Mother migrated during child's life	3077	0.20	4535	0.07
Mother migrated during child's life and her pregnancy	3077	0.27	4535	0.11
HH head age	3892	42.24	5942	42.34
HH head is male	3892	0.63	5942	0.65
HH head is literate	3860	0.86	5908	0.89
HH has an improved toilet facility	3887	0.63	5935	0.60
HH has cement floor	3889	0.56	5943	0.55
HH uses for cooking: coal, gas, electricity	3891	0.19	5943	0.24
HH has electricity	3884	0.26	5940	0.27
HH has phone	3884	0.04	5943	0.05
HH owns a car	3884	0.05	5939	0.05
HH is poor (asset sum below province and survey level average)	3862	0.48	5927	0.53

Notes: please note that on an average a child under age 60 months surveyed in 2005 was exposed to violence for the whole duration of his/her life. Therefore, child's average age in months = child's average number of months of exposure to conflict (for 27.97 months).

Table A2 – Survey comparability, 1999 ZDHS vs. 2005/2006 ZDHS

	Panel A: No province fixed effects							Panel B: Included province level fixed effects						
Variables	ln events* Survey 2005		Survey 2005		ln events, 2000-2005		R-sq	N	ln events* Survey 2005		Survey 2005		R-sq	N
	(1)		(2)		(3)		(4)	(5)	(1)		(2)		(3)	(4)
Rural	0.018		-0.063		-0.226		0.16	7614	0.005		-0.023		0.56	7614
Poor hhd	-0.091		0.533		-0.043		0.03	7576	-0.098	*	0.564		0.05	7576
Household Head														
Age	1.999	***	-10.122	**	-3.327	***	0.02	7612	2.027	***	-10.263	**	0.03	7612
Male	0.027	***	-0.148	***	0.054	**	0.02	7612	0.029	***	-0.157	***	0.04	7612
Literate (some school)	-0.002		0.028		0.035		0.01	7570	-0.004		0.046		0.03	7570
Mother's characteristics														
Age	0.262		-1.646	*	-0.700	***	0.01	7614	0.245		-1.563	*	0.01	7614
Literate (some school)	-0.010		0.083		0.020		0.01	7614	-0.010		0.085		0.03	7614
No education	0.010		-0.083		-0.020		0.01	7614	0.010		-0.085		0.03	7614
Has primary education	-0.016		-0.004		-0.092	*	0.04	7614	-0.015		-0.015		0.08	7614
Secondary education	0.002		0.107		0.108	*	0.04	7614	0.002		0.118		0.10	7614
Higher education	0.004		-0.020		0.004		0.00	7614	0.004		-0.018		0.01	7614
Mother's religion														
Christian	-0.033	*	0.224	**	0.038		0.01	7604	-0.028		0.198	*	0.03	7604
Traditional	0.007		-0.048		0.000		0.00	7604	0.004		-0.033		0.03	7604
No religion	0.024	**	-0.131	**	-0.038	**	0.01	7604	0.022	*	-0.122	*	0.03	7604
Religion is other or Muslim	0.002		-0.045		0.000		0.01	7604	0.001		-0.042		0.04	7604
Interview Language														
Shona	0.016		-0.050		0.276	*	0.40	7614	0.018	**	0.883		0.89	7614
Ndebele	-0.010		0.030		-0.272	**	0.41	7614	-0.013		0.870		0.87	7614
other (other and English)	-0.006		0.020		-0.004		0.01	7614	-0.006		0.022		0.02	7614

Notes: each row/Panel combination is a separate regression. Each column reports a coefficient estimate from an OLS regression. Regressions in Panel A are estimated without province fixed effects and Panel B regressions account for them. Robust standard errors in parentheses, clustered at the province level. * significant at 10%; ** significant at 5%; *** significant at 1%. Data sources: 1999 and 2005/2006 DHS for Zimbabwe and Raleigh et al. (2010).

Table A3 – Triple Differences Regressions: controlling for gender specific effects. Months of exposure.

	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N months exposed to political violence * ln events	-0.002	-0.001	-0.001	-0.001	-0.001	-0.004*	-0.004*	-0.004*	-0.003*	-0.003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Female* N months exposed to political violence * ln events	-0.003**	-0.004**	-0.004**	-0.003**	-0.004**	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Female*N months exposed to political violence	0.016*	0.016*	0.017*	0.016*	0.017**	0.008	0.008	0.007	0.008	0.008
	(0.008)	(0.007)	(0.008)	(0.008)	(0.007)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
N months exposed to political violence	-0.030***	-0.031***	-0.031***	-0.032***	-0.034***	-0.028**	-0.029**	-0.029**	-0.031**	-0.031**
	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.011)	(0.011)	(0.011)	(0.010)	(0.011)
Female* ln events	0.038	0.042	0.05	0.033	0.053	0.130	0.130	0.126	0.131	0.126
	(0.071)	(0.070)	(0.066)	(0.071)	(0.065)	(0.082)	(0.082)	(0.083)	(0.085)	(0.084)
Female	0.013	-0.005	-0.04	0.038	-0.055	-0.389	-0.393	-0.368	-0.395	-0.374
	(0.371)	(0.369)	(0.347)	(0.371)	(0.343)	(0.404)	(0.407)	(0.412)	(0.426)	(0.417)
rural	-0.279**	-0.263**	-0.265**	-0.242**	-0.016					
	(0.101)	(0.097)	(0.094)	(0.106)	(0.097)					
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes
N	6555	6555	6519	6548	6524	5023	5023	4992	5017	5003
R squared	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.11	0.11

Notes: Sample: children age 0-59 months in 1999 and 2005/2006 DHS. Robust standard errors in parentheses, clustered at the province level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is a child's height-for-age z-score (HAZ). All regressions include year of birth, age in months and province of residence fixed effects. The interview language dummies include: Ndebele, other (English and other) with Shona being a reference category. Mother's characteristics: mother's age, and a set of controls for mother completing one of the following education levels: primary, secondary, higher education, and other ("no education" is a reference category). Household head characteristics: household's head age, gender (=1 if male) and an indicator for household head being literate (completed some education). Household's assets include a set of dummy variables for: having access to a toilet facility, have cement floor in a household, for cooking hhd used electricity, natural gas, or coal; household has access to electricity, phone, and a dummy for household owning a car. Data sources: ZDHS 1999, ZDHS 2005/2006, and ACLED (Raleigh et al. 2010).

Table A4 – Triple Differences Regressions: controlling for gender specific effects. Non-linear measures of exposure.

	Full sample					Rural sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female*Exposed 1-24m* ln	0.037	0.031	0.018	0.036	0.01	0.069	0.070	0.072	0.069	0.082
events	(0.109)	(0.109)	(0.114)	(0.111)	(0.123)	(0.080)	(0.081)	(0.081)	(0.090)	(0.088)
Female*Exposed 25plus m *	-0.111*	-0.120**	-0.131**	-0.115*	-0.132**	-0.032	-0.032	-0.030	-0.032	-0.025
ln_events	(0.051)	(0.050)	(0.052)	(0.053)	(0.052)	(0.124)	(0.125)	(0.130)	(0.130)	(0.128)
Exposed 1-24 months * ln	-0.071	-0.066	-0.064	-0.072	-0.046	-0.177	-0.174	-0.176	-0.177	-0.165
events	(0.113)	(0.114)	(0.116)	(0.114)	(0.124)	(0.121)	(0.122)	(0.120)	(0.124)	(0.128)
Exposed 25 plus months * ln	-0.056	-0.048	-0.047	-0.052	-0.033	-0.231**	-0.227**	-0.228**	-0.226**	-0.220**
events	(0.060)	(0.059)	(0.063)	(0.060)	(0.066)	(0.069)	(0.067)	(0.069)	(0.070)	(0.065)
Exposed for 0-24 months	-0.331	-0.355	-0.379	-0.321	-0.454	0.066	0.048	0.04	0.072	0.002
	(0.698)	(0.704)	(0.714)	(0.704)	(0.747)	(0.673)	(0.683)	(0.681)	(0.690)	(0.708)
Exposed for at least 25	-0.610	-0.650	-0.661	-0.648	-0.744	0.103	0.080	0.071	0.070	0.016
months	(0.391)	(0.390)	(0.412)	(0.390)	(0.409)	(0.559)	(0.555)	(0.569)	(0.538)	(0.552)
Female*Exposed 1-24m	-0.212	-0.184	-0.124	-0.217	-0.085	-0.349	-0.354	-0.365	-0.365	-0.419
	(0.560)	(0.561)	(0.582)	(0.576)	(0.623)	(0.306)	(0.308)	(0.303)	(0.347)	(0.349)
Female*Exposed 25plus m	0.480	0.523	0.567*	0.500	0.571*	0.015	0.018	-0.001	0.011	-0.018
	(0.307)	(0.298)	(0.304)	(0.320)	(0.308)	(0.637)	(0.638)	(0.664)	(0.671)	(0.654)
Female* ln events	0.014	0.02	0.031	0.01	0.037	0.102	0.103	0.100	0.103	0.094
	(0.057)	(0.056)	(0.051)	(0.059)	(0.050)	(0.075)	(0.075)	(0.075)	(0.081)	(0.079)
Female	0.142	0.115	0.067	0.170	0.040	-0.253	-0.256	-0.233	-0.249	-0.211
	(0.312)	(0.308)	(0.278)	(0.324)	(0.283)	(0.360)	(0.361)	(0.362)	(0.395)	(0.389)
rural	-0.256**	-0.241**	-0.244**	-0.226*	-0.006					
	(0.097)	(0.093)	(0.090)	(0.103)	(0.094)					
Interview language	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes	No	No	No	No	Yes
N	6555	6555	6519	6548	6524	5023	5023	4992	5017	5003
R squared	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10

Notes: as for Table A3.

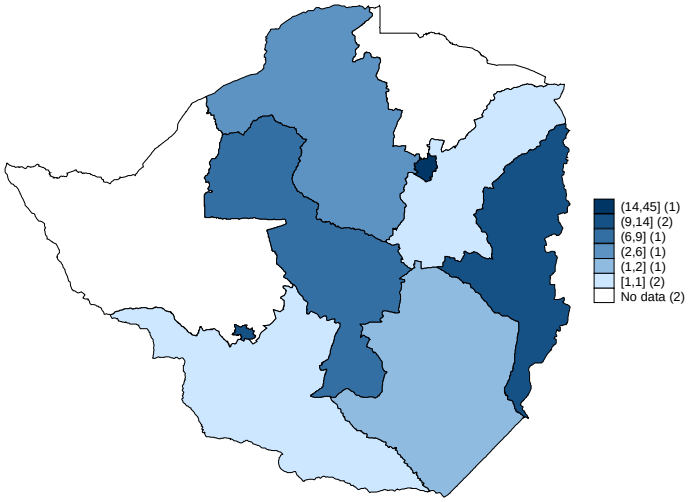
APPENDIX – NOT FOR PUBLICATION

Appendix A: Spatial depiction of conflict-related events in Zimbabwe, 1997-2006

Figure A1 - Conflict-related events in Zimbabwe, 1997

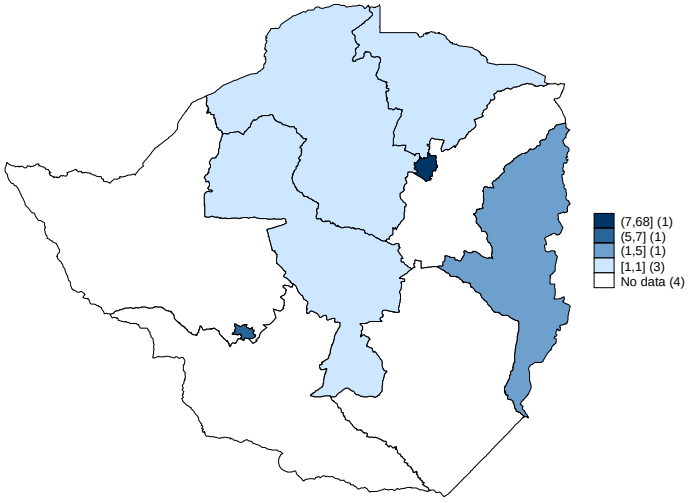
Data Source: ACLED dataset (Raleigh et al., 2010). The two largest cities that are also separate provinces in Zimbabwe are marked on the map.

Figure A2 - Conflict-related events in Zimbabwe, 1998



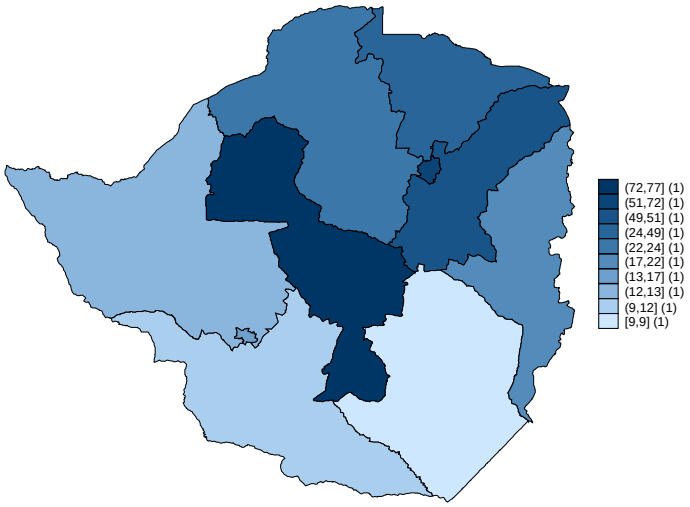
Data Source: as for Figure A1.

Figure A3 - Conflict-related events in Zimbabwe, 1999.



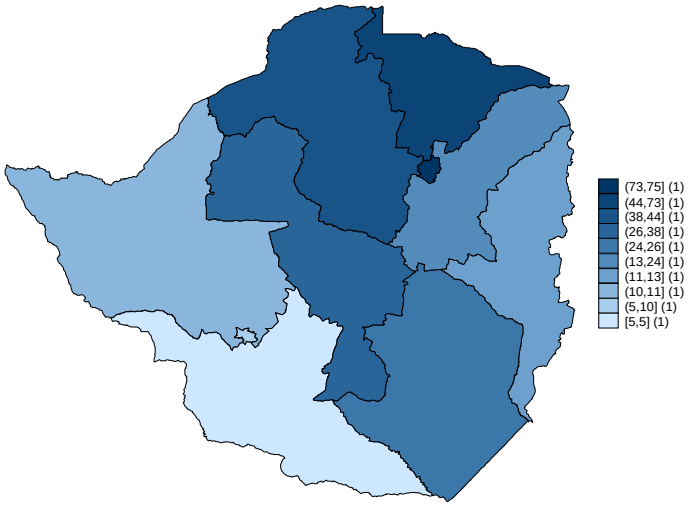
Data Source: as for Figure A1.

Figure A4 - Conflict-related events in Zimbabwe, 2000.



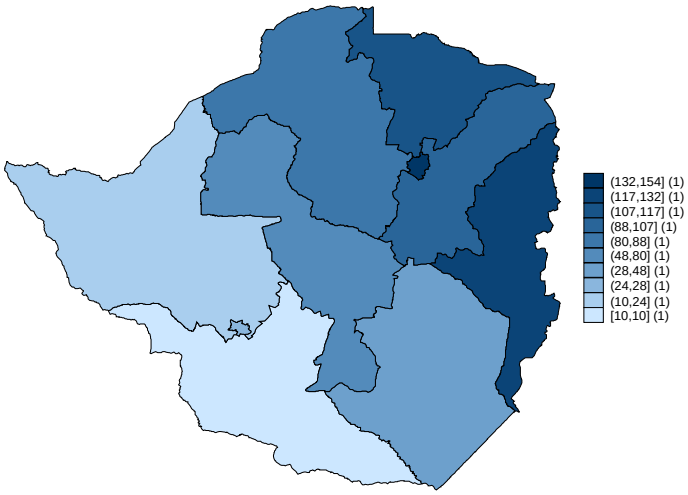
Data Source: as for Figure A1.

Figure A5 - Conflict-related events in Zimbabwe, 2001.



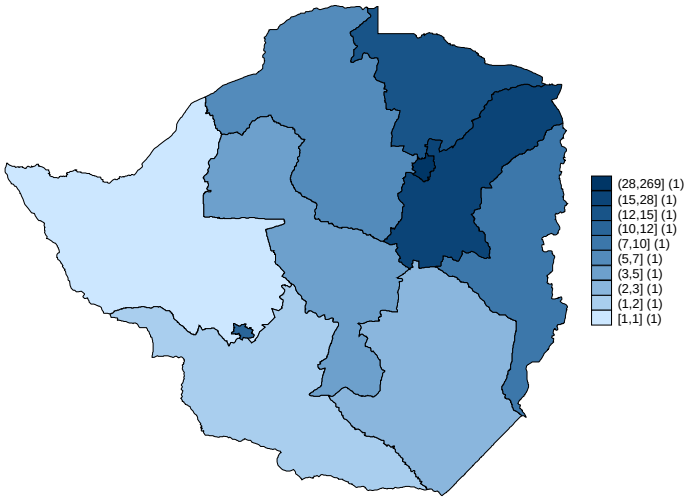
Data Source: as for Figure A1.

Figure A6 - Conflict-related events in Zimbabwe, 2002



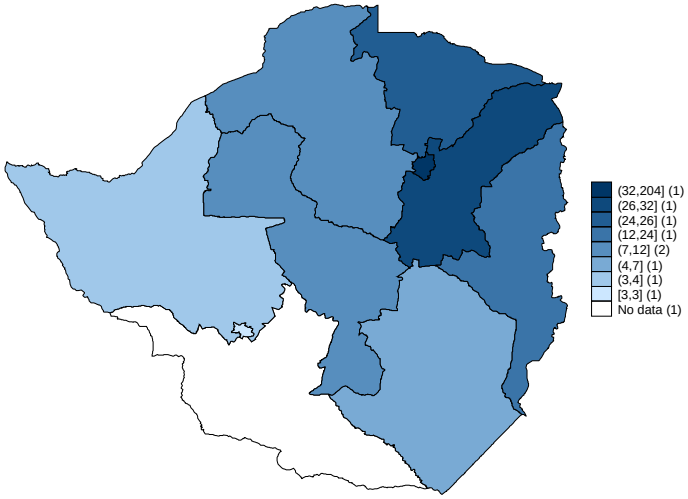
Data Source: as for Figure A1.

Figure A7 - Conflict-related events in Zimbabwe, 2003



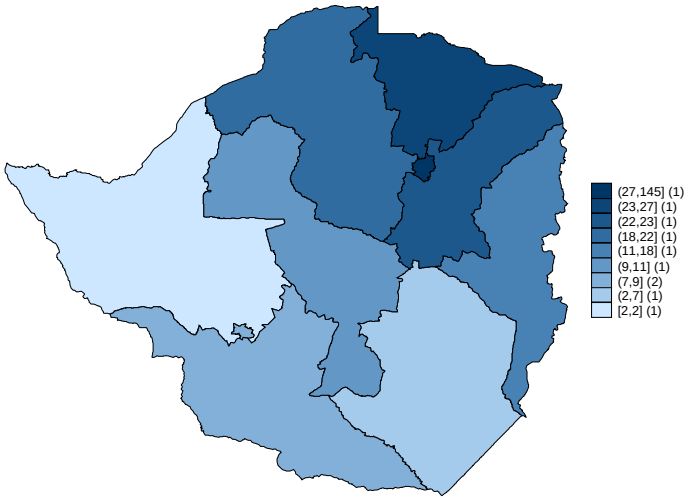
Data Source: as for Figure A1.

Figure A8 - Conflict-related events in Zimbabwe, 2004



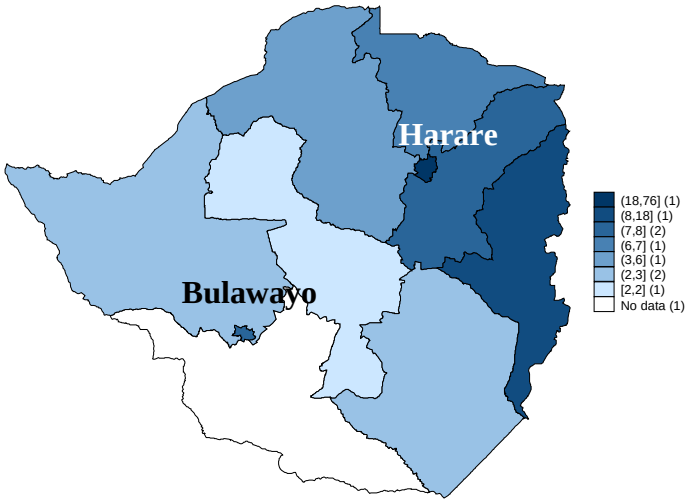
Data Source: as for Figure A1.

Figure A9 - Conflict-related events in Zimbabwe, 2005



Data Source: as for Figure A1.

Figure A10 - Conflict-related events in Zimbabwe, 2006



Data Source: as for Figure A1.

Appendix B

Timeline of Important Events in Zimbabwe: 1998-2008

1997 – war veterans, that were tied to the land movement in Zimbabwe, forced Mugabe to the negotiation table. They both agreed that the white commercial farms will be ceased and distributed to these in need of land, with 20 percent being allocated to war veterans. The Government designated 1,471 commercial farms for a compulsory acquisition, which was contested by white farmers and no resettlement happened at the time (Moyo, 2000; Sadomba, 2008).
1998 – some of the early war-veteran led farm occupations happened in Zimbabwe (Cliffe et al. 2011; Sadomba, 2008).
1998 – involvement in the war in the Democratic Republic of Congo
September 1999 – Formation of the Movement for Democratic Change (MDC) (Kriger, 2005: p. 26).
February 2000 – the referendum by the ruling party on the proposed draft constitution that included a provision that allowed Mugabe to seek two extra terms in office, "granted government officials immunity from prosecution"[13] and included the amendment by Mugabe to confiscate the land owned by whites (Kriger, 2005: p. 26). The proposed draft of the constitution was rejected by 54% of the voters, with only one fourth of the registered voters participating (Kriger, 2005).
2000 – Fast track land reform program (FTLRP): between February and June, about 1,500 white-owned commercial farms were invaded.
June 2000 – parliamentary elections, the ruling party won 62 out of 120 contested seats, MDC won 57 seats, and ZANU(Ndonga) kept their seats. While the ruling party had the majority in the parliament, the MDC had a large minority and a sufficient number of seats to preclude the ruling party from single-handedly making changes to the constitution (Krieger, 2005: p. 26).
Post 2000 election period:
The ruling party leaders repeatedly intimidated the MDC party supporters by issuing threats and physically attacking these who were affiliated with the MDC and these who display their party affiliation.

The increase in the intense violence in the post-referendum period was unprecedented even for Zimbabwe that has a culture of violence and intimidation occurring during the election years as described by Krieger (2005) who covered the ZANU(PF) strategies in general elections in 1980-2000.

About 200,000 cases of violence occurred in the first half of 2000 (Kriger, 2005, p. 29 - related to footnote 172). This sharp rise in targeted violence forced the MDC to stop it's campaign in many rural constituencies.

ZANU(PF) targeted these affiliated with the MDC, and the ruling party also executed widespread purges of government officials. The army and the police continued to terrorize civilians into the first months of 2001 (Krieger, 2005: p. 30, also ft. 177).

March 2002 - presidential elections, subversion of the electoral process, intimidation of the opposition and the voters ensured Mugabe's victory.
2002-2005 – troubles within the opposition party.

2005 – Operation Murambatsvina: "Drive out the Rubbish" or officially "Operation Restore Order": the government bulldozed and de-legalized settlements in the cities and resettled large numbers of rural residents. Many residents were forced to destroy their own houses. Some accounts suggest that young children, elderly and the disabled were killed in the process (Hammar, 2008: p. 427). Sadomba (2008)

[13] http://en.wikipedia.org/wiki/History_of_Zimbabwe#The_economy_during_the_1980s_and_1990s. Accessed: September 4, 2012.

argues that Murambatsvina was developed as a part of a formal intervention by the government into the land movement and an attack on War Veterans. Multiple properties, especially those in urban locations, were destroyed (Sadomba, 2008).

09/2005 - Constitutional amendments that reinstituted a national senate (abolished in 1987) and that nationalized all land. This converted all ownership rights into leases."

The numbers of displaced during the Operation Murambatsvina range from 120,000 (police accounts) to 323,385 (Zimbabwe Human Rights NGO Forum, 2005). About 2.4 million individuals were affected by the campaign (Tibaijuka 2005). The campaign also led to 700,000 million unemployed. As housing included a lot of informal sector production sites and workshops containing tools and other means of production, people living in these areas were also deprived of their livelihoods. The police, the youth movement that supported the government and the army participated in the destructions of housing stock.

Hammar (2008) reports that the relocated families were forcibly resettled, often miles from their prior places of residence into camps that lacked access to water, sanitation or means to earn a living. The Washington Post (2008) reports that some residents had to walk to their workplaces for 18 miles per day as they could not afford the bus fare to the city.

2008 – defeat of ZANY(PF) in the presidential elections and retaliation by the ruling party against the political opposition (MDC).

Data Appendix
Maps:
Downloaded maps from http://www.maplibrary.org/stacks/africa/Zimbabwe/index.php

Stata map routine:
http://www.stata.com/support/faqs/graphics/spmap.html

ACLED routine:
Manually matched ACLED identified locations to provinces in Zimbabwe. Performed multiple Google using locations names and also used maplandia.com.