Health outcomes of children in Northern Uganda: Does current IDP status matter?

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ABSTRACT

Health status during childhood is a relevant target of policies in developing countries, with implications that go beyond *current* wellbeing. Health status in IDP camps, particularly in periods of ongoing violent civil conflict, has been assessed in different surveys. There is a related interest in the dynamics of post-conflict relocation of former IDP residents and how it relates to health outcomes: study of these situations may help to identify which groups are most at risk. In this paper, we study the process of camp decongestion and it impact on children's health. We use a recent survey that is representative for the population who has *ever* resided in an IDP camp in Northern Uganda, a conflictive region for the last 2 decades. We combine this data with a geo-coded conflict event dataset to account for potential selection in location (whether the child is still living/commuting to an IDP or not). We find that access to safe water and *current* non-IDP status correlate with lower morbidity among children. We derive post-conflict health policy implications based on these findings.

Very preliminary version. Please do not quote.

Introduction

Health status during childhood is a relevant target of policies in developing countries. The Millennium Development Goals, for instance, establishes as a central priority the reduction in child mortality. The primacy of childhood health is explained, at least in part, by the implication that child health has on livelihood outcomes later in life. Different studies (Miguel and Kremer 2004; Bleakley 2007, among others) have argued for long lasting effects of illness during childhood, which influence educational outcomes and income generation during adulthood.

It is no surprise that in regions affected by violent mass conflicts health outcomes are severely affected. In those places, childhood health status is affected through different channels. Displacement and posterior unsanitary conditions in internally displaced persons´ (IDP) camps may affect health outcomes. However, IDP camps may ironically provide better health services than those experienced by the displaced population in areas outside IDP camps. Therefore, it is not clear *a priori* whether the return of populations from IDP camps has a positive impact on children's health outcomes.

In this paper, we study the process of camp decongestion and it impact on children's health. We use a recent survey collected between April and May 2007 that is representative for the population who has *ever* resided in an IDP camp in Northern Uganda, a conflictive region during the last 2 decades. We combine this information with a detailed conflict event dataset to jointly model the determinants of camp demobilisation and child health outcomes.

Health of children during conflict: a brief review of the literature

There is an extensive literature on children's health in conflict affected regions. Guha-Sapir and van Panhuis (2002) summarize the different channels through which conflict may have an indirect effect on health outcomes. Armed conflict may inflict damage to the economy, creating food shortages that result in malnutrition and starvation. Displacement of large numbers of affected citizens may set the stage for unsanitary conditions derived from the lack of clean water, sanitation and appropriate shelter. Additionally, damage to health infrastructure may affect the provision of basic health services (prevention and treatment) which turn in poorer health outcomes.

In a paper assessing the long term effect of civil wars on health outcomes, Ghobarah et. al (2003) find an effect of warfare on disability adjusted life-years (DALYs), an indicator of years of healthy and productive life, which captures adverse health outcomes such as early mortality, disease and disability. This effect is particularly prominent in the age group of children under age 5. Their results are based on country level data, and therefore they cannot isolate differences within each country.

Using household level data from Rwanda, Akresh et al (2006) find, among other results, that civil conflict negatively affects health outcomes in children, and that this effect seems to impact both rich and poor households. Instead of using indicators of morbidity or mortality, they focus on anthropometric measures, such as height for age, which are a proxy for long run nutritional status. It is important to indicate that nutritional status may not only be affected by food intake, but also by illnesses that affect absorption (diarrhoea) or that affect calorie expenditure (fever), interfering with the ability of the body to process and use nutrients for the different stages of development.

Finally, there are studies in our country of interest. Ssewanyana and Younger (2005) study the determinants of infant mortality (deaths during the first year of life), using 3 demographic and health surveys that span over three decades. Although this study does not directly study the effect of conflict on outcomes, it provides useful information about relevant covariates in Uganda that may affect child outcomes. Maternal education, household assets (a proxy of wealth) and mother's age stand out as important determinants of mortality. Water source and sanitation, on the other hand, seem to have an effect that overlaps with asset holdings.

In this study, we focus on post-conflict dynamics and its impact on health outcomes in children. In particular, we evaluate whether children whose family stays in IDP camps after the conflict finished fare better or worse than those whose families has moved away from the camp. Our study is informative on key post-conflict public health policies that could have an impact on child health outcomes and thus on wellbeing. In particular, we find that accessibility to safe water is reduced in those relocating away from the camps and this in turn negatively affects certain health outcomes, such as the incidence of diarrhoea. We also find that camps exacerbate the likelihood of acute respiratory infections, this result probably linked to overcrowding and unsanitary conditions.

Background: Conflict and Health in Uganda

Conflict

Northern Uganda has undergone a long civil strife period since 1986. The roots are complex to describe, but tensions between the northern Acholi population and the central government can be traced to the pre independence period (before 1962), where south-based elites ruled, and again since President Museveni took office in the Kampala (capital city), in 1986. The rebel group Lord Resistance Army (LRA) initially benefited from this distrust between the northern Acholi population and the central government, but it was soon clear that the local population was also to suffer from this dispute. The LRA's *modus operandi* consisted mainly in surprise guerrilla attacks to villages in order to seek supplies and to abduct citizens as an involuntary mechanism of combatant recruitment. This long strife meant that a large fraction of the population in the region has been displaced for a long time (OCHA,2006), placed in overcrowded camps (FAFO, 2005) and prevented to return to their villages of origin because of security concerns. In 1996 the central government induced civilians to move into “protected villages”. Sporadic attacks from LRA also forced voluntary displacement. In 2002, the government directly forced the remaining inhabitants in non IDP villages to move to the camps. The conflict was exacerbated by the national military offensive “Operation Iron Fist” in 2002, to which the LRA responded with attacks to locals, resulting in abductions to compulsively recruit soldiers and lootings to replenish supplies.

The most affected sub-region has been Acholiland (districts of Gulu, Kitgum and Pader), but also the West Nile, Lango and the Teso sub-regions have been affected to some extent. In August 2006, the government of Uganda and the LRA agreed on a cease fire, although dwellers in many camps still have fears over security and whether a long-lasting peace could be achieved. While the camp population has been decreasing from about 1.7 million at the end of 2005 to 0.8 million in May 2007, in regions such as Acholiland only 2% of former IDPs has returned to their place of origin. Some families are commuting to camps on a daily basis, in particular those whose place of origin was close to the camp. (OCHA 2007 b). The decongestion from camps is a complicated process because it requires, among other things, to guarantee basic living conditions (access to health services and education) for the population leaving the camps. The services provided in the camp (school, health) theoretically act as pull factors, deterring the relocation decision. However, relocation incentives ("relocation packages") and the situation at the place of origin may encourage the movement out of the camp. While in this study we do not focus on the decision to relocate, we control for different factors that may affect that decision.

Child Health in Northern Uganda

As a result of this protracted conflict, human development indicators in the region of Northern Uganda have not improved as they have in the rest of the country. In 1993, headcount poverty rates were 73.5% and 56.4% for Northern Uganda and for the overall country respectively. By 2006, national poverty estimates dropped to 31.1%, but only to 60.7% in the Northern region[1]. Other indicators collected in the Uganda National Household Survey (2005-06) show similar levels of relative deprivation.

It is not surprising given this context, that health indicators of children living in IDP camps are different from nationally representative cohort of Ugandan children. According to the recent Demographic and Health Survey (DHS) administered in 2006, under five mortality rates (number of children dead under age 5 per 1000 live births) was 200 in IDP regions for the period 1996-2006 compared to about 150 in the national average. World Health Organization organized a survey in IDP camps in Northern Uganda (Gulu, Kitgum and Pader districts), finding malaria, malnutrition and diarrhoea as the principal determinants of death under age 5.

Morbidity indicators show a similar picture. According to DHS results, 60% of children under the age of 5 experienced fever (a marker for potential malaria or respiratory infection) in the IDP sample, compared to only 41% at the national level. The indicators for diarrhoea (a condition that interfere with absorption of nutrients and which if left untreated may lead to death) in the same cohort were 44.3% and 25.8% respectively. However, there are other indicators that may yield a different perspective. For example, 53.6% of children age 12-23 months in the IDP sample had all basic vaccinations (BCG, Measles and three doses each of DPT and polio vaccine), compared with the national average of 46.2%.

[1] Regional estimates for Northern Uganda comprehend different regions which have been exposed to different levels of conflict intensity. As Ssewanyana et. al (2007) indicate, the North-East region of Karamoja is poorer than Acholiland, mainly due to cattle rustling.

The Data

Household Survey in current and former IDP camp residents (UBOS/FAFO)

Different agencies have collected information on the evolution and situation of the IDP population in the regions affected by civil strife. In April/May 2007, the Ugandan Bureau of Statistics (UBos) and FAFO Institute for Applied International Studies collected information of about 4000 households among IDP and return population in Amuru, Gulu, Kitgum, Pader, Lira and Oyam Districts, using a two-stage cluster design. Although the principal unit of analysis is the household, information on household members (age, gender, place of origin and migration, skills, etc.) was also collected. It is important to notice that the study is representative for households in the region who have *ever* been in an IDP camp. Therefore, this data allows us to compare subgroups of households (and children who inhabit in them) who were at some point IDP camp residents.

A particular limitation of the dataset is that it did not collect anthropometric information (a proxy for nutritional deficiencies), caloric intake or professional assessment of health status. These are assessments done in conflictive environments, and so the collection of complementary indicators of health status is difficult to undergo. The sample size represents an attractive feature which compares favourably to other surveys, in particular nationally representative household, demographic and health surveys for which the sample of current/former IDP households is substantially smaller and perhaps inadequate to make inferences within such subpopulation.

The interviewers collected information on acute and chronic illnesses and limitations to normal activities. Since this study concentrates on child health, we will focus in indicators of acute illnesses during a recall period of two weeks, since cases of chronic illnesses or disability are rare in the cohort of children. Injuries and trauma related to the war tend to increase substantially in individuals age 10 or older, outside our cohort of interest. There is also data on mortality, but the timing of deaths is not exact and therefore it is not possible to evaluate whether the mortality event occurred in the camp or after a potential relocation.

Conflict intensity: The ACLED database

Although this paper is concerned with the impact of IDP conditions and of relocation from these camps on the health of children, it is possible that the decision to abandon the camps after the peace-talks were underway is in part determined by health concerns. This may make location at the time of the survey depend on health status of household members, and thus it is necessary to model the decision to leave or stay linked to the IDP camp and account for this selection on health outcomes. This endogeneity is a hypothesis to be tested and may –if valid- create a bias in estimates of the effect of IDP residence on child health outcomes. In order to find an exogenous source of variation we have resorted to very disaggregate conflict location data which we describe in the next paragraphs.

This paper makes use of ACLED, an Armed Conflict Location and Events dataset building on the Uppsala/PRIO armed conflict dataset. This dataset identifies location (in geographic coordinates) and specific information on individual battle events and rebel activity in 8 conflict countries in West and Central Africa from 1960 through 2004, including Uganda. This dataset is central for studies integrating geographical variables as relevant covariates in measuring outcomes and behaviour during internal conflict phases.

The dataset is based primarily from specialized press accounts and books. The unit of observation is an event, involving two actors, a rebel group and the government. Thus for Uganda, since 1962 there are 1276 such events registered. Location of the event is defined at a village level for 96% of the events.

The conflict in Northern Uganda we study here is linked mostly to the rebel groups HSM/LRA (Holy Spirit Movement and Lord's Resistance Army), which by themselves account for 547 events over the period 1987 and 2006, peaking in 158 events for the year 2004 alone. About 90% of these events result from battles and an additional 8% from rebel activity without involving fights. Figure 2, taken from ACLED documentation papers provided from the Centre for the Study of Civil War show a map of Northern Uganda and depict conflict intensity according to the number of events by administrative units.

We use ACLED event information to construct an intensity of conflict indicator which is applied to any desired location. Instead of counting events by district of reference, we select a location for which to calculate the intensity and then weight events nearby by the distance of these events from the point of reference. To be concrete, let events be labelled by subscript i, and denote the coordinate of the event defined by the two-dimensional vector c_i. Let the location of interest, for which we desire to construct a synthetic conflict intensity index be l (again, a two-dimensional vector with geographic coordinates). In principle, if we confine in all events occurring in a given year, the conflict intensity for location l_i is defined as

$$C(l)=\sum_i g(d(c_i,l))$$

where d is a distance function (either the Euclidean distance or the geographical distance) and g(.) is a decreasing function or kernel which role is to "discount" events by their distance from the location point of reference. In principle, in this simple formulation, any event occurring in a fixed year could add to the intensity of the conflict in a specific location. Function g(.) is crucial for weighing events depending on their distance. Without loss of generality have defined g(x)= exp(-αx) and $d(c_i,l)=\|c_i-l\|$, with α=5. In this configuration events happening at 25km of distance are weighted by a factor of 0.78, those occurring at 50km distance are associated to an impact factor of 0.38 and those events occurring at 100km of distance have an impact of 0.02. We have also counted events occurring in the year prior and posterior to the reference year in which the intensity-location pair is measured, but discounting these adjacent year observations by a factor of exp(-1)=0.37.

Figure 3 shows fluctuations in the conflict intensities -as defined above- by location and time. Kampala, the capital city, located in the Central region is taken as a reference, along with three cities in the Northern region. The capital city has been relatively free from conflictive events since the mid 80s, whereas in the North, conflict between rebel groups and the government has been present in the during the last decade, peaking in 2004 to decrease afterwards after cease-fire talks.

Summary statistics

Table 1 portrays the main indicators for children under age 5, tabulated by IDP status. For simplicity of exposition, we have divided location in two groups. One includes all children living in an IDP camp or commuting to the camp. The other group comprehends children who moved away from the camp, either to their place of origin or to a new settlement.

As the Table shows, children living in IDP camps are more likely to have experienced the demise of their father or mother. Other indicators of vulnerability, such as living in a female headed household or having a widowed mother are not statistically different between current and former IDP children under age 5.

Children whose households have left the camp experience some differences with the other groups. On the one hand, they live in places where access to safe sources of water (tap water or protected well or borehole) is limited. On the other hand their households have a higher number of assets[2], a proxy of higher socioeconomic status. The fact that these children not living or commuting to IDP camps tend to be less likely to receive food or seeds assistance cannot necessarily be taken as an indicator of disadvantage, because their needs may differ from those in the IDP camps.

In terms of exposure to current and previous conflict intensity (as defined by our index), children in IDP camps are different from those who have relocated elsewhere. The typical head of household in IDP camps (with children under age 5) tends to have been exposed to significantly higher levels of conflict in 2006. In addition, their place of birth (an indicator of alternative residence opportunity) has also experienced substantially higher levels of conflict intensity during 2006, potentially preventing them to relocate away from the camps.

Given these differences, morbidity rates (proxied by a number of symptoms) may need to be adjusted in order to obtain a meaningful comparison of how different location environments affect child health outcomes. The problem here is one of inference: it is not possible to identify how children relocating away from the camp would have fared had they stayed in the camps. This counterfactual (as well as the symmetric for the children living in camps) is unobservable, and thus comparing morbidity rates may not be appropriate to uncover the true effect of relocating away from the camps. In any case, morbidity rates for any acute illness in the last 2 weeks as well as the main types of morbidity causes do not seem to differ between camp children and non-IDP camp children. This could be due to differences between children and their households (access to water, overcrowding, unobserved underlying health status) but could also have been influenced by the selection between families leaving the camps and those who have stayed in the camps or commuting to them. It is order account for this potential selection that we introduce a bivariate probit model in the next section.

Accounting for IDP status: a bivariate model of location and health outcomes

As suggested before, the location of the children (linked to an IDP or not) may depend on the health status of these children. Parents may stay in or around an IDP camp to have access to

[2] Assets include radio/cassette player, bicycle, motorbike, bed, tables, blankets, mattress, cupboard, sewing machine, cell phone, panga/machete, hoe, plough, rifles, slingshot, jerry, can, torch/flashlight.

health facilities and thus children with poorer underlying health conditions may remain in the camps. In order to account for this potential endogeneity between location and health status, we will use geographical variables to instrument for location and then focus on the structural equation of interest, linking IDP status –plus covariates- to health outcomes of children.

Since both IDP status and health outcomes of interest (morbidity) are dichotomous, we model a bivariate probit where IDP status and health outcome are jointly modelled.

We postulate a recursive model along the lines of Maddala (1983), with a reduced form for a potentially endogenous dichotomous variable y_{1i}^* (in our case IDP residence status of the child) and the structural equation of interest for variable y_{2i}^* (in our case child health status, the morbidity indicator). These two variables are linked through the system

$$y_{1i}^* = \beta' X_{1i} + u_{1i}$$
$$y_{2i}^* = \gamma y_{1i} + \delta' X_{2i} u_{21}$$

and the usual relation between the dichotomous variable and its latent analogous, that is

$$\begin{cases} y_{ki} = 1 \Leftrightarrow y_{ki}^* > 0 \\ y_{ki} = 1 \Leftrightarrow y_{ki}^* \leq 0 \end{cases} ;\ k=1,2.$$

In its simplest formulation, error terms are assumed to have the following distribution

$$\begin{pmatrix} u_{1i} \\ u_{2i} \end{pmatrix} \sim iidN\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix} \right).$$

Parameters are estimated via ML. More on identification requirements can be found in Wilde (2000). Small sample properties have been discussed in Fabbri et al (2004).

Regression results

The bivariate probit explicitly models the decision to leave the camps. Thus, it is worth evaluating the determinants of location before turning to the recursive probit model. Table 2 shows the result of a logit model where the dichotomous variable is being a resident or commuting to an IDP camp at the time of the survey. We model this decision for adults age 18-55. Age seems to be an important determinants, displaying a u-shaped pattern. Animal husbandry (current or previous) is correlated with relocation away from the camp, probably being one of the skills that enhances the benefits of leaving the camp. The other determinants are indicators of conflict/violence intensity. If their place of birth was highly conflictive in 2006, they are more likely to remain in the camp, and the same is true if the region adjacent to the camp was also violent in 2006 (which may have precluded or delayed demobilisation).

In our simultaneous model, IDP status of the child is modelled on information from the head of household the child is living in. The head of household is, more likely, the person who would have more influence in relocating away from the camp, having an impact on the location of the child IDP status itself. Table 3 shows the bivariate probit estimates, first providing estimates of the structural equation linking IDP status and morbidity of the child and then the “first stage” equation where IDP status is modelled and controlled for.

How does morbidity correlate with household and environmental characteristics? Even controlling for covariates, are there differences between the residence status of children? The dependent variables in the table are the existence of an episode of illness during the last two weeks. These episodes include different presumptive illnesses proxied by symptoms of malaria/fever, diarrhoea and severe cough (an indicator for respiratory infections). We have included as outcomes having experienced at least one symptom category and the 3 leading categories: fever/malaria, diarrhoea and cough/TB (Figure 1).

Incidence of a child illness episode (all causes) in the recall period of 2 weeks is correlated with mother’s vital status: children whose mother is alive are less likely to have experienced illness in the last 2 weeks. This effect is also present in the category of fever/malaria. It is remarkable that household assets do not seem to be correlated with child health in this context, probably because other factors such as water provision or IDP status have more prominent effects.

We find that being in or commuting to a camp increases the chances of being ill, mostly because of cough/TB, a marker for acute respiratory infections. Although this is speculative, overcrowding may be one of the reasons behind this result.

Measures of safety of water sources (either by access to safe water or by the presence of safe water source nearby) reduces the chances of diarrhoea and fever/malaria. The causal mechanism over malaria is not clear, though.
There are also sub-regional differences between the districts worth to be noticed: for example the above average prevalence of acute respiratory infections in Lira and Oyam.

In terms of the first stage, children location in IDP camps is influenced by the intensity of conflict in the place of birth of the head of household and the gender of the head of household: female headed households tend to be more likely to remain in camp, even when the definition of household members is broad enough to include members who might be temporally living somewhere else.

Discussion and conclusion

to be completed

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Table 1

Selected indicators for the cohort of children under age 5, by type of residence.

	Moved away from Camp	Still in the Camp or Commutes	p-value of Ho: Difference=0
Indicator: Father known to be alive	**88.5%**	**84.7%**	**0.026**
Indicator: Mother known to be alive	**95.2%**	**91.9%**	**0.005**
Age of Child (yr)	2.69	2.72	0.673
Indicator: Access to safe water	**52.70%**	**92.70%**	**0**
Indicator: Mother known to be Widow	6.10%	5.00%	0.427
Indicator: Female Headed Household	15.80%	17.90%	0.404
Indicator: Number of Assets, HH	**5.94**	**5.53**	0.038
Indicator: HH receives food	**65.20%**	**81.30%**	**0**
Indicator: HH receives seeds	**51.30%**	**66.70%**	**0**
Age of Head of HH	38.50%	38.30%	0.754
Dependency Ratio	1.79	1.82	0.716
Intensity of Violence, location of Head of HH in 2006	**5.77**	**12.89**	**0**
Intensity of Violence, birthplace of HH in 2006	**4.93**	**7.7**	**0**
Joint Indicator: Fever/Malaria, Severe Cough/TB, Diarrhoea, Vomiting	18.10%	18.50%	0.838
Indicator: Children w/Fever-Malaria last 2 wk	10.0%	10.2%	0.851
Indicator: Children w/Diarrhoea last 2 wk	3.3%	3.8%	0.508
Indicator: Children w/Cough-TB last 2 wk	2.4%	1.9%	0.504

Table 2

Determinants of IDP status in adults age 18-55. Survey Logit model

	Is the person still in/near IDP? (Adults 18-55) logit model
Age	-0.061
	[0.039]
Age Sq.	**0.001**
	[0.001]*
Female	0.067
	[0.095]
Violence Intensity at Birthplace in 2006	**0.233**
	[0.039]***
Ever did Agriculture	-0.078
	[0.310]
Ever herd animals	**-0.371**
	[0.151]**
Ever involved in petty trade	0.073
	[0.159]
Violence Intensity at Location in 2006	**0.118**
	[0.020]***
Distance to place of Birth, 2006	0.129
	[0.208]
Constant	-3.952
	[6.543]
Observations	4958

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3

Determinants of Acute Morbidity in Children under age 5.

Bivariate probit estimates

	Was the child ill during the last 2 weeks?			
	All causes	Fever/Malaria	Diarrhoea	Cough/TB
Age Mother	0.034	0.013	0.039	0.137
	[0.045]	[0.050]	[0.085]	[0.092]
Age Mother Sq	-0.001	0	-0.001	**-0.003**
	[0.001]	[0.001]	[0.001]	**[0.002]***
Indic: Age Mother Unk	0.034	-0.47	0.328	1.545
	[0.787]	[0.853]	[1.451]	[1.355]
Indic: Mother Alive	**-0.31**	**-0.51**	-0.146	0.196
	[0.176]*	[0.277]*	[0.322]	[0.364]
Indic: Mother Life Status Unk	0.174	-0.415	0.585	0.571
	[0.278]	[0.395]	[0.430]	[0.420]
Gulu	-0.245	-0.098	0.07	0.183
	[0.173]	[0.177]	[0.245]	[0.229]
Kitgum	**-0.404**	-0.169	-0.107	-0.102
	[0.166]**	[0.182]	[0.238]	[0.219]
Pader	-0.177	-0.047	0.231	0.127
	[0.165]	[0.192]	[0.221]	[0.207]
Lira	0.106	0.024	0.411	**0.703**
	[0.236]	[0.306]	[0.333]	[0.243]***
Oyam	-0.007	-0.044	0.389	**0.663**
	[0.213]	[0.222]	[0.283]	[0.231]***
Indic: Age <12 mo	**0.436**	**0.455**	**0.56**	-0.164
	[0.147]***	[0.147]***	[0.211]***	[0.274]
Indic: Age 1	**0.58**	**0.515**	**0.729**	-0.343
	[0.133]***	[0.149]***	[0.194]***	[0.238]
Indic: Age 2	**0.47**	**0.54**	**0.478**	-0.225
	[0.158]***	[0.171]***	[0.158]***	[0.264]
Indic: Age 3	0.18	**0.239**	0.241	-0.306
	[0.129]	[0.143]*	[0.232]	[0.266]
Indic: Age 4	0.17	0.163	0.288	-0.159
	[0.136]	[0.131]	[0.256]	[0.235]
Female	**-0.218**	-0.09	**-0.25**	**-0.323**
	[0.082]***	[0.096]	[0.116]**	[0.115]***
Number of Assets	0.008	-0.01	0.033	0
	[0.016]	[0.019]	[0.023]	[0.026]
Ind: IDP resident or commutes to IDP	**0.644**	0.098	0.199	**1.573**
	[0.355]*	[0.500]	[0.615]	[0.429]***
Dependency ratio	**-0.101**	-0.078	-0.06	**-0.177**
	[0.051]**	[0.055]	[0.076]	[0.099]*
HH Size Sq	0.003	0.006	-0.012	0.005
	[0.006]	[0.005]	[0.010]	[0.005]
HH Size	-0.102	-0.129	0.129	-0.113
	[0.089]	[0.082]	[0.165]	[0.107]
Ind: Access to safe water (tap or protected well)	**-0.685**	**-0.706**	-0.14	-0.134
	[0.274]**	[0.347]**	[0.329]	[0.327]
Log Distance to Safe Water Source	0.066	0.012	**0.145**	0.011

	[0.050]	[0.045]	[0.073]**	[0.059]
Age Head of HH	**0.045**	0.016	**0.076**	0.052
	[0.021]**	[0.026]	[0.044]*	[0.043]
Age Head of HH Sq	**0**	0	-0.001	0
	[0.000]**	[0.000]	[0.000]	[0.000]
Indic: Female Head of HH	0.071	0.124	-0.027	0.133
	[0.103]	[0.103]	[0.202]	[0.237]
Constant	-1.339	-0.055	-4.829	-5.326
	[1.009]	[1.076]	[1.815]***	[1.459]***
First Stage | Determinants of IDP status (Still linked to IDP camp or not)				
Age Head of HH	-0.005	-0.004	-0.005	-0.005
	[0.027]	[0.027]	[0.027]	[0.027]
Age Head of HH Sq	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]
Indic: Female Head of HH	**0.441**	**0.452**	**0.447**	**0.453**
	[0.164]***	[0.167]***	[0.164]***	[0.163]***
Indic: Head of HH ever had Animals	-0.077	-0.083	-0.083	-0.051
	[0.106]	[0.105]	[0.104]	[0.108]
Indic: Head of HH ever involved on Petty Trade	0.041	0.046	0.036	0.033
	[0.106]	[0.112]	[0.123]	[0.103]
Indic of Violence at place of birth of Head of HH in 2006	**0.117**	**0.119**	**0.119**	**0.118**
	[0.031]***	[0.031]***	[0.032]***	[0.031]***
Indic of Violence in Location 2006	0.045	0.048	0.003	0.042
	[0.030]	[0.024]	[0.031]	[0.030]
Indic of Violence in Location 2006	0.005	0.001	0.046	0.006
	[0.024]	[0.030]	[0.024]	[0.024]
Distance of Head of HH in 2006 to place of Birth	-0.038	-0.026	-0.03	-0.061
	[0.208]	[0.209]	[0.213]	[0.211]
Constant	0.701	0.326	0.471	1.388
	[6.257]	[6.272]	[6.390]	[6.338]
Number of Observations	2683	2679	2679	2679

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1 : Incidence symptoms/Illness in the 2 weeks prior to survey of children under age 10, by age.

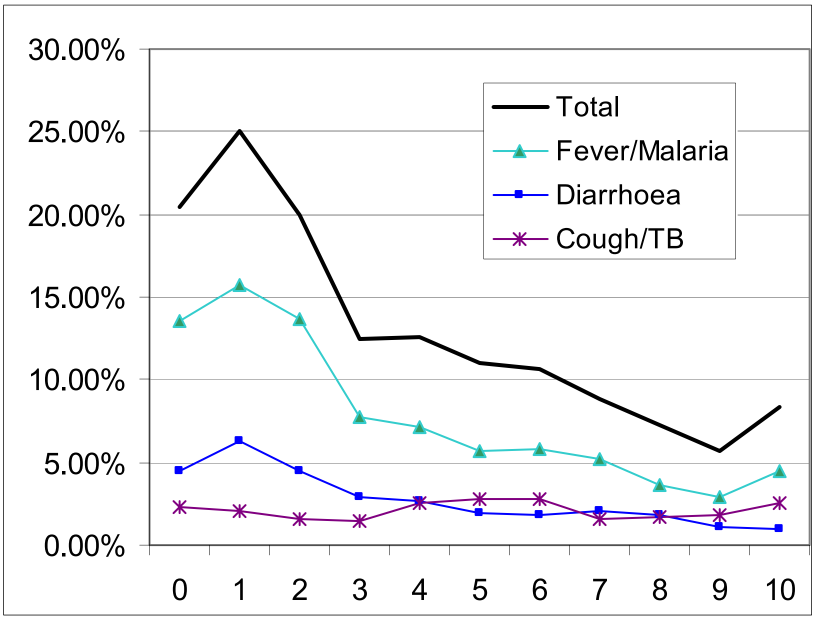

Figure 2: Intensity of LRA Events according to ACLED, from Low to Very High.

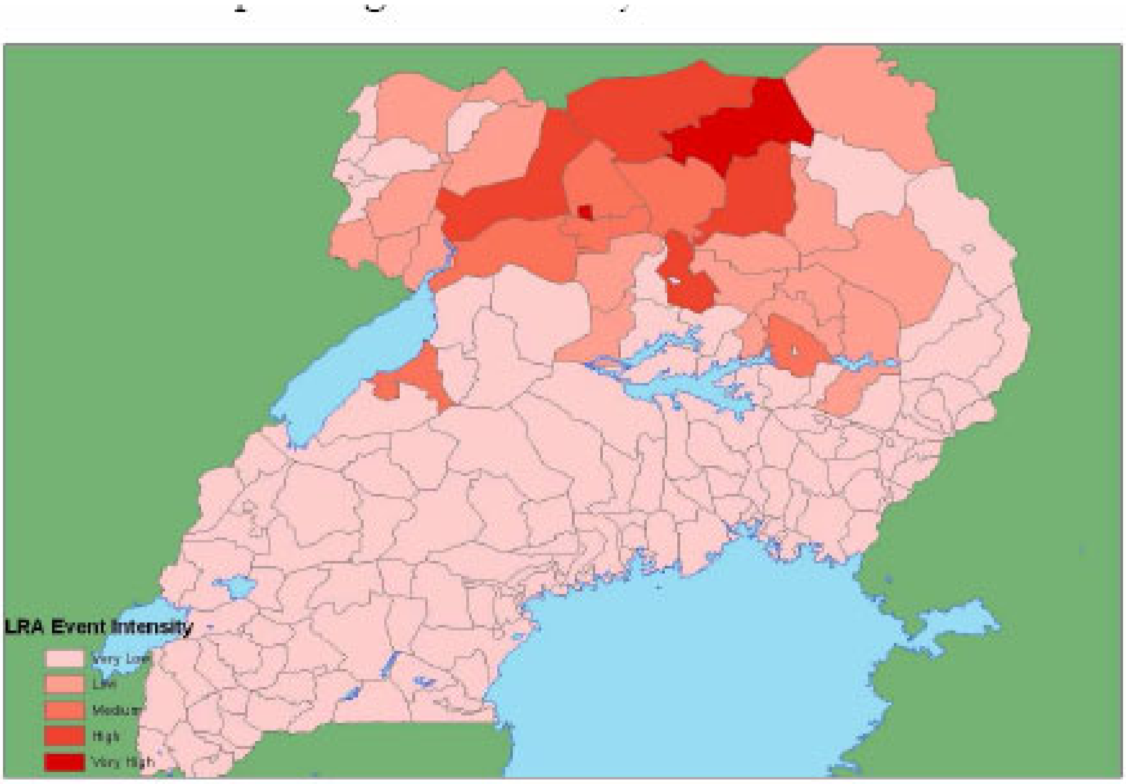

Figure 3: Selected ACLED conflict scores, Uganda