Neonatal and infant mortality under violent conflicts in the Democratic Republic of the Congo

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Introduction and background

The impact of war on reproductive health and infant mortality was highlighted at the 1994 International Conference on Population and Development in Cairo. Research focusing on reproductive health and fertility among war-affected population has since then emerged (Agadjanian and Prata 2002; Lindstrom and Berhanu 1999; McGinn 2000; Abu-Musa 2008). War-affected populations suffer from poor maternal health, infant mortality and poor pregnancy outcomes and during active stages of conflict the outcomes are even poorer due to factors associated to space and place as well as population dynamics and the duration of the conflict. War, political instability and corruption of the government are found to be related to an increase in infant mortality rates (Norton 2005; Verwimp and Bavel 2005). For a pregnant woman living in war-affected areas exposes her to a critical life event that is not only stressful on the mother and fetus, but also to other children that she might already have. Many countries burden by war has seen an increase of infant mortality rates, such as Iraq, Somalia and Angola. The primary reason for an increase in infant mortality is related to being victims to the direct killings, other significant factors are the destruction of the health sector and economic recession limiting access to medical service and supplies as well as malnutrition. The average body weight of war-affected population will drop and many war-affected countries rely on foreign aid for basic nutrition (Toole et al. 1993). Sexual violence and rape during war has been occurring throughout history and has been documented to be used as a weapon of war (Farwell 2004). Studies on women who have been victimized by war rape that resulted in pregnancy or occurred during pregnancy suggest that these women are more likely to experience infant death of their child (Asling-Monemi et al. 2003; Emenike et al. 2008). Poor health and critical life events of the mother during pregnancy will increase the risk for her to miscarry, have a stillbirth or to loss her child within the first month of living after the birth.

The Congolese wars provide an opportunity to evaluate neonatal mortality and infant mortality associated with the exposure to high levels of social upheaval and violent conflicts. During the Congolese wars the social upheaval and political/ethnic violence unraveled unevenly throughout Congo allowing for a regional analysis of neonatal and infant mortality outcome for women who gave birth during the conflict period and after-math period in comparison to non–conflict periods. This paper investigates the odds ratio of neonatal and infant mortality across time and place. The analysis is based on a combined data set employing unique macro-level data on violent conflict at regional level that are linked to micro-level data on birth histories of individual women. The data used is from the Congo Demographic Health Survey (2007) and from Uppsala Conflict Data Program-Georeferenced Event Dataset (UCDP GED 2011).

Research question

Neonatal mortality refers to newborn children who die within the first month after birth and infant mortality refers to children dying within their first year since birth. Distinguishing these two forms of mortality is valid as neonatal mortality is closely related to the characteristics of the mother, while

infant mortality relates more to the child's health. This paper examines the odds ratio for neonatal and infant mortality occurring during violent conflicts compared to periods of no conflicts. I expect to see higher odds ratio during the conflict period compared to periods of no conflicts periods and for regions that where more affected by the conflict in terms of number of conflict events and number of estimated deaths per region and year.

Data and method

The study makes use of combined data on women's reproductive histories from the Congo Demographic Health Survey (DHS) from 2007 and violent conflict at the regional level from the Uppsala Conflict Data Program- Georeferenced Event Dataset (UCDP GED 2011). The survey is nationally representative and interviews were completed with 9,995 women. Detailed information on sampling design and fieldwork are available in the Congo Democratic Republic DHS, 2007- Final Report (2008). The UCDP GED conflict data provides annual data from 1989-2010 on violent conflict in Congo.

Conflict is measured indirectly and directly, the indirect conflict indicators simply indicates the time and the region when we know that there was conflict and the direct conflict indicators are categorized into low, medium and high based on the estimated number of deaths and conflict events per region and year. The analysis uses multinomial logistic regression to analyze child outcomes; died first month, died 2-12 months, survived.

The first model assumes no unobserved heterogeneity and provides estimates for neonatal and infant child mortality for each birth as a function of birth order, age at first birth, education, rural/urban and death of previous child.

The second model takes advantage of the birth histories of each mother creating a panel of children within the mother, which can be useful in identifying causal effects. The model pools live births observed at different time points in relation to the conflict and to account of non-independence of residual for the sibling subset in the data the model clusters the standard error by mother. The model includes variables that vary across the births; age at each birth, birth order, previous death of child and birth during conflict.

Implications of the study

The results will contribute to a deeper understanding of how neonatal and infant mortality is affected in conflict regions. There are many current armed conflicts around the world in countries such as Syria, Central African Republic and South Sudan. The UN estimates that every fourth person in the world live in areas affected by violent conflicts. Consequences of violent conflicts are starvation, diseases, sexual transmitted infections, sexual violence affecting women's reproductive health as well as the health of newborns and infants. The aftermath period of a violent conflict is marked with many problems related to a rebuilding phase depended on the geographical spread of the conflict and the impact that the conflict had on the political, economical arena as well as on infrastructure and human capital.

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