

The Demography of Armed Conflict: Reconstructing demographic estimates before, during and in the aftermath of the 1998 – 2004 D. R. Congo armed conflict

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***"Inaccurate statistics can undermine an argument, even if it is motivated by a moral imperative." (Michael Nest, 2011)***

*In an effort scientifically to document and monitor the scale and scope of recent conflicts (1998-2004) in the Democratic Republic of Congo (DRC), the International Rescue Committee (IRC) in conjunction with some of the world's leading epidemiologists conducted a series of five surveys in the country over a seven year period (2000 – 2007). Estimates of conflict-related mortality generated from the IRC's surveys range from 3.3 million between the years 1998 and 2002, to 5.4 million excess deaths in the period between 1998 and 2007. Reflecting on the IRC's work, this study aims to combine four different data sources – 1984 DRC Population Census; 1995 and 2001 DRC Multiple Indicator Cluster Surveys (MICSs) and the 2007 DRC Demographic and Health Survey (DHS) – to derive demographic estimates and assess the extent of change, in demographic components, to be associated with the conflict period between years 1998 and 2007. Both statistical and demographic techniques will be used for this purpose. The current paper presents selected preliminary findings of this study.*

## **Introduction**

It has been acknowledged that both the demographic causes and the consequences of armed conflicts carry important policy implications (Brunborg, Tabeau, & Urdal, 2006). This is due to the fact that armed conflicts can have severe pervasive affects on components of population change and on the environment. However, despite the devastating nature of conflict and the sustained media coverage it receives, quantifying objectively the effects of armed conflicts on demographic components of population change is difficult. Such difficulty is often the result of the uncertain availability and quality of the required demographic data or the knowledge of environmental issues connected to the conflict. The uncertain nature of much demographic data poses a greater challenge in poorer countries than in rich ones and it gets worse in areas and periods of armed conflicts (Brunborg & Tabeau, 2005). In this respect, the main question for this study will be: is it possible to measure objectively the

extent to which armed conflict affects the environment and demographic components of population change? If yes, what is the best way to conduct such assessment?

This extended abstract explains the work of this study in three parts. The first part gives the background to the choice of approach, contrasting that with previous approaches to the examination of the impact of conflict on the Democratic Republic of Congo's (DRC's) demography. The second part looks at the methodology; it provides a succinct yet detailed explanation about how this study is expected to use statistical and demographic knowledge to address its questions. The last part looks provides tentative conclusions about how to interpret and use the results.

To allow comparability between the results of this study's reconstruction, and those of other previous studies, the reference period and the types of components of population change to assess had to be defined clearly. The period (1998 – 2004) has been defined on the basis of key events in the country's history and the availability of most reliable data on population. Key events provide the context under which components of population change are being assessed. Periods covered by the census and selected surveys may not be equidistant but they give reliable schedules upon which baselines and subsequent benchmarks will be set when reconstructing demographic estimates.

## **Background**

Up to now, the International Rescue Committee's (IRC's) work on excess death due to conflict in the DRC has been the main study informing the international community and the United Nation's peace keeping mission and policy making on the DRC (United Nations, 2010). Despite its high profile and its effort to deal with a very difficult question, selected aspects of the IRC's study can be challenged. In this respect, this paper looks at selected aspects such as the IRC's baseline mortality rate, its under-five mortality rate and its methodology to propose an alternative approach.

**First**, the IRC used the sub-Saharan African average of 1.5 deaths per 1000 per month as its baseline mortality rate. For the IRC, this Sub-Saharan mortality rate was conservative since the DRC government's own mortality rate was estimated at 1.3 per 1000 per month by the 1984 census whilst UNICEF estimated the same rate at 1.2 per 1000 per month rate for the same period (Coghlan, et al., 2009, p. 2).

**Second**, the IRC based its calculation of child mortality on a nationwide child mortality rate of 5 under-five deaths per 1,000 per month, yet other prominent surveys showed that rate to be only about half the IRC's estimate. That is the case with the 2007 Demographic and

Health Survey (DHS) which estimated the same rate, over a five year span, at only 2.46 deaths per 1,000 per month, which is almost half the IRC's estimate of 5 deaths per 1000 per month.

**Third** and last, two out of the five surveys conducted by the IRC only covered war-affected parts of the DRC and only the three subsequent surveys were nation-wide (Coghlan, et al., 2009, p. 2). This complicates the comparison of demographic estimates from war affected areas over time, since it is known that the conflict did not have the same intensity at the national level (Turner, 2007).

How is this paper going to address the IRC's shortcomings as presented in the section above?

For the **first** and **second** points, in projecting forward the baseline population from 1984 census as suggested above, this paper will enable the identification of a range of variations in population size due to the effect of age-specific fertility, mortality and migration as dictated by realistic projection assumptions during the reference period. Due to the economic crisis in the late 1980s and the political instabilities in the early 1990s, it can be said that a mortality rate that was estimated at 1.3 per thousand per month by the DRC government in 1984, could have experienced severe and rapid changes to far more than 1.5 deaths per 1000 per month; the IRC's baseline rate in years close to the start of the conflict (International Monetary Fund, 2003).

The IRC assumed, for instance, a sudden change in age-specific mortality rates or those of any other component of population change between two very distant points in time; 1984 before the conflict and during the conflict (Coghlan et al., 2009, p. 2). This study's approach will, instead, continuously monitor changes in demographic rates for the entire reference period. It is important to observe variations in the rates throughout the reference period and across the whole geographical area to avoid missing sudden changes that can be caused by other socio-economic factors (Siegel & Swanson, 2008, p. 562).

On the **third** and last point related to methodology, to avoid implying that potential changes in demographic estimates from war affected areas in this period will also be nation-wide, this study is to assess variation in the components of population change at both the national and sub-national levels, whilst controlling for selected demographic estimates. In this way it will be possible to account for differentials related to both the reference period and geographical space characterising the population at risk.

## **Methodology**

Following Heuveline (1998), the cohort component method of projection will be used for this study. Missing demographic estimates will be generated through indirect methods of estimation since the data sources used here may not contain all the estimates needed in the analyses (Preston, Heuveline, & Guillot, 2001; Siegel & Swanson, 2008). This study's method involves, essentially, calculating the future size of cohorts whilst taking into account the effect of fertility, mortality and migration at a national as well as at a sub-national scale under realistic assumptions. Table 1 shows how the study will proceed.

Table 1

Summary of projection process by year considered, data available and projection

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**PANEL (i): WAR SETTING (REAL-WORLD SCENARIO)**

<b>Year</b>	<b>Data</b>	<b>Reconstruction operation</b>
<b>1984</b>	<b>Census</b>	a. Forward projection to <b>1995</b>
<b>1995</b>	<b>MICS I</b>	b. Use estimates ( <b>MICS I</b> ) to adjust <b>1984</b> -based projection (a) then project again to <b>2001</b>
<b>2001</b>	<b>MICS II</b>	c. Use estimates ( <b>MICS II</b> ) to adjust projected population from (b) then project again to <b>2007</b>
<b>2007</b>	<b>DHS</b>	d. Use DHS estimates to benchmark projected rates then project up to year <b>2010</b>

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**PANEL (ii): NON-WAR SETTING (COUNTERFACTUAL SCENARIO)**

<b>Year</b>	<b>Data</b>	<b>Reconstruction operation</b>
<b>1984</b>	<b>Census</b>	A. Forward projection to <b>1995</b>
<b>1995</b>	<b>MICS I</b>	B. Use estimates ( <b>MICS I</b> ) to adjust <b>1984</b> -based projection (A) population then project again to <b>2007</b>
<b>2007</b>	<b>DHS</b>	C. Planned end of projection but can be extended by conducting a forward projection from <b>2007</b> DHS to year <b>2010</b> .

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Table 1 above, shows two panels (i) and (ii) summarising operations to be conducted under a WAR scenario (i) and a NON-WAR scenario (ii). From panel (i) the reconstruction operation for the WAR scenario proceeds as follows:

- a. 1984 census is the baseline population to be projected forward up to year 1995, using realistic assumptions.
- b. From 1995, MICS I estimates will be introduced in the projection to set a new benchmark enabling the population projected forward again up to year 2001, using realistic assumptions.
- c. From year 2001, MICS II estimates are introduced in the projection to set another updated benchmark enabling the population projected forward again up to year 2007. Here the projection will again use realistic assumptions but MICS II estimates are considered to have been potentially influenced by the conflict as this started around years 1996-1998.
- d. For this period, a forward projection up to year 2010 will be made using DHS estimates. This projection will help benchmark projected rates so far before taking it to year 2010.

Panel (ii) shows the NON-WAR scenario. Operations similar to those in panel (i) will be conducted but here the main assumption is that the 1984 baseline population has never been disturbed by conflict. In other words, it is assumed that the DRC population as estimated at the latest census in 1984 followed its trend undisturbed – no pervasive events such as armed conflicts influenced it. Therefore, the analysis proceeds as follows:

- A. The 1984 baseline population will be projected forward up to year 1995, using realistic assumptions.
- B. From the year 1995, MICS I estimates will be introduced in the projection to set a new benchmark enabling the population projected forward again up to year 2007, using realistic assumptions alone.
- C. Using the 2007 DHS data as baseline, a forward projection will be conducted up to year 2010.

### **Tentative conclusions**

From the difference between the WAR and NON-WAR scenarios it will be possible to evaluate, for instance, potential excess deaths or fertility shortfall corresponding to the reference period or indeed to any given period covered by the data. This study will not seek to produce one best estimate alone, but to generate a range of estimates spread across time and space hence capturing the true value of potential change in demographic components features. In other words, following Heuveline (1998), instead of adjusting an initial estimate for potential excess death or fertility decline by iteration, this study will derive these

estimates purely as residuals of the population dynamics by comparing scenarios from panel (i) and panel (ii) in Table 1.

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