

A Demographic Analysis of War-Related Mortality and Migration in Liberia, 1989-2003

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Abstract

In 2003, the Accra Comprehensive Peace Agreement (ACPA) concluded fourteen years of civil war in Liberia. During the conflict, the civilian population was affected by hostilities through war-related mortality (both through direct civilian killings and increases in preventable diseases, resulting from the disruption to health care, food security and transportation systems). This paper presents demographic analysis developed for the Liberian Truth and Reconciliation Commission (TRC). The analysis draws on data from DHS and MICS surveys, pre- and post-conflict censuses and data collected by the Liberian TRC. It presents estimates of war-related mortality alongside analysis of conflict-related migration. This paper is the first scientific paper on estimating the full mortality impact of the Liberian civil war on civilian mortality. It draws heavily on classical child and adult mortality estimation techniques used in developing countries, and intercensal survival methods (including the Generalized Growth Balance Method and the Synthetic Extinct Generations Method).

Extended Abstract

Background

From 1979 to 2003, the Liberian people suffered extreme violence from armed conflict, mass displacement, and severe human rights abuses perpetrated by a wide range of actors during the nations brutal civil war. On August 18, 2003, a Comprehensive Peace Agreement was adopted in Accra, Ghana, formally ending the prolonged civil conflict.

In order to address the magnitude of the violence in Liberia, in accordance with its official mandate, the TRC needed to estimate the total number of people who died during the conflict in excess of normal peacetime mortality. Estimates of 250,000 is a commonly cited figure for the total number of people who died during the conflict in Liberia, but some estimates go as high as 400,000. All of these estimates are either based on anecdotal evidence or estimation techniques that are not scientifically defensible. By applying well-recognized demographic estimation methods to available population-level data, we can better understand the conflict-related mortality impact on civilians in Liberia.

Objectives

In order to assist the Liberian TRC in meeting its mandate of clarifying the past and uncovering the impact of the conflict on civilians, we estimated the total and "excess" mortality during the

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Liberian conflict. ¹ We define "excess" mortality as the estimated mortality which occurred in an excess of the expected mortality if pre-conflict conditions remained the same during the conflict period.

To better understand the impact of the conflict on civilian mortality, we disaggregate our estimates by infant/adult status and sex to ascertain which parts of the population were disproportionately affected. Then to further understand the association between conflict-related migration and conflict-related mortality, we analyze our estimates alongside migration data collected by the Liberian TRC.

Data and Methods

The lack of multiple data sources specifically on conflict-related mortality is a limitation in Liberia. However, there have been a number of official statistical projects which collected general mortality data in Liberia. These include population censuses in 1962, 1972, 1984 and 2007, Demographic and Health Surveys in 1986 and 2007, and a Multiple Indicator Cluster Survey in 1995. Standard demographic methods can be adapted to these data sources to estimate infant/child and adult mortality. Furthermore, these data can be used to estimate the magnitude of mortality during the conflict that is in excess of that which is expected based on pre-conflict mortality rates, referred to as "excess mortality".

Previous work in Sierra Leone and Timor-Leste has shown that, during times of conflict in least developed countries, indirect mortality (resulting from infectious disease and famine conditions) can be a substantial proportion of total conflict-related mortality.² In particular, in such conflicts when people's lives are disrupted due to large-scale property destruction, looting and conflict-related displacement, indirect mortality (particularly infant and maternal deaths) can rise substantially. Our analysis of available TRC data suggests that property violations and conflict-related displacement were widespread, and that excess mortality is an outcome of these conflict dynamics.

In order to estimate excess mortality, estimates of baseline (or "normal") mortality prior to the conflict are required. Such estimates are possible with the available population census data in Liberia.

We use Hill's Growth-Balance (GB) method (which does not require strong assumptions of a stable population) to estimate both the completeness of coverage of deaths relative to population enumerations and the possible change in coverage between census enumerations. ³ We also draw on Synthetic Extinct Generations (SEG) methods pioneered by Preston et al. (1980) and Bennett and Horiuchi (1984) which use population growth rates above age x to expand recorded

¹Total mortality being mortality from all causes, including deaths from causes not related to the conflict.

²Silva, Romesh and Patrick Ball. "The Demography of Conflict-Related Mortality in Timor-Leste (1974-1999): Empirical Quantitative Measurement of Civilian Killings, Disappearances & Famine-Related Deaths" In J. Asher, D. Banks and F. Scheuren, eds., *Statistical Methods for Human Rights*, Springer (New York) (2007)
Guberek, Tamy, Daniel Guzmán, Romesh Silva, Kristen Cibelli, Jana Asher, Scott Weikart, Patrick Ball and Wendy M. Grossman, "Truth and Myth: Human Rights Violations in Sierra Leone, 1991-2000." A Report by the Benetech Human Rights Data Analysis Group and American Bar Association's Central European and Eurasian Law Initiative. 6 March 2006.

³Hill, K. (1987). "Estimating Census and Death Registration Completeness", *Asia and Pacific Population Forum*, vol. 1, No. 3 (May 1987) pp. 8-13, 23-24.

deaths over age x to estimate the number of deaths over age x in the corresponding stationary population; completeness of death recording is then estimated by comparing the population aged x to the sum of stationary population deaths above age x .⁴

Building on earlier work by Hill, we develop a two-stage process, by which the GB method is applied first to estimate any change in census coverage, and the SEG method is then applied to data after adjusting the census numbers for possible coverage change.⁵ This hybrid method controls for the sensitivity of the SEG method to changes in coverage between censuses. We use these estimates to construct baseline and excess mortality estimates.

We extend our work in two ways: firstly, by using the available DHS and MICS data to construct infant and child mortality estimates. This allows us to decompose our mortality estimates into adult and infant/child components. Secondly, we conclude the paper by comparing our mortality results to migration data collected by the Liberian TRC. We note the temporal and spatial shifts in migration are consistent with those in excess mortality - suggesting that the two processes share a common cause.

Conclusion

In this paper, we draw heavily on existing pre and post-war demographic data on Liberia, including four population censuses, three household survey datasets and migration data collected by the Liberian TRC. We adapt intercensal survival estimation methods and child mortality estimation techniques to these data to estimate the total and "excess" mortality associated with the Liberian civil war. We conclude by reviewing these mortality estimates alongside data on conflict-related migration to understand the association of these two phenomena and their dual impact on the civil population.

⁴Preston, S. H. and others (1980). "Estimating the completeness of reporting of adult deaths in populations that are approximately stable." *Population Index* No. 46, pp.79-202.

Bennett, N. G., and S. Horiuchi (1984). "Mortality estimation from registered deaths in less developed countries", *Demography*, vol. 21, No. 2, pp. 217-234.

⁵Hill, K. (2001). "Methods for Measuring Adult Mortality in Developing Countries: A Comparative Review." Paper presented to the International Population Conference, Salvador, Brazil.