Towards the Sustainable Development Goals: Accounting for Inequalities in Neonatal Mortality in Sub Saharan Africa

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Abstract
Child mortality is undeniably a core indicator for child health and well-being. Recent assessment of the progress in achieving the MDGs has documented accelerated progress in improving child survival in the 2000-2015 period. While the global annual rate of reduction in under-five mortality rate increased from 1.8% (1990–2000) to 3.9% (2000–2015), progress in achieving the MGD 4 target has been insufficient. We track progress in equity of neonatal mortality rates in sub Saharan Africa based on national population-based surveys conducted between 1990 and 2014. Assessing trends in neonatal mortality is inevitable due to the prominent and increased share of under-five deaths occurring during the neonatal period. Further, most interventions aimed at improving survival during the neonatal period are different from those aimed at addressing other under-five deaths. Understanding the trends and contributing factors to the stalled progress is critical when planning effective interventions to reduce neonatal mortality.

Extended Abstract
Introduction
Child mortality is one of the key indicators for measuring social economic development. It is undoubtedly a core indicator for child health and well-being. The onset of the Millennium Development Goals (MDGs) in 2000 set the stage to track progress in reducing by 2015 two thirds of the under-five mortality in the world using 1990 as a reference point (MDG 4). The focus was mostly in less developed countries and Sub Saharan Africa (SSA) in particular since these were regions with the highest under-five mortality since 1990s.

Since 2000, the world has witnessed several on-going projects and interventions aimed at reducing under-five mortality. Several initiatives have been taken to ensure that child survival improves globally. For example, the Global Strategy for Women’s and Children’s Health launched by the United Nations Secretary-General, Ba Ki-Moon and the Every Woman Every Child movement boosted global momentum to improve maternal and child health. Recognizing the need for concerted efforts to improve child survival, world leaders renewed their commitment in June 2012 to end preventable child deaths.

The agenda towards universal improvement in child survival and maternal health is still on track. With the end of the MDG era, the international community has taken stock of the progress made in attaining MGD 4. The core results of this assessment are both positive and worrisome. For example, the United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME) report of 2015 demonstrates through annual updates of child mortality estimates that major progress has been made in reducing child mortality globally. Notably, this progress has accelerated in the years towards the 2015. For example, global under-five mortality rate (U5MR) dropped 53% from 91 deaths per 1,000 live births in 1990 to 43 in 2015. At the regional level, all MDG regions except Oceania have more than halved the U5MR. Eastern Asia, Latin America and the Caribbean, and Northern Africa have at least exceeded the MDG 4 target. Another notable progress is that about a third of countries (62) have reduced their under-five mortality by two-thirds or more and achieved the MDG4 target set in 2000 (UNICEF 2015: 3).

In examining these trends, the most appealing results are that SSA, the region with the highest burden of under-five mortality globally, has also witnessed accelerated decline in under-five mortality. SSA annual rate of reduction increased from 1.6% in the 1990s to 4.1% in 2000–2015. Of the 49 SSA countries, all but 5 had a higher annual rate of reduction in the 2000–2015 period compared with the 1990s (UNICEF 2015: 4).

While the world celebrates the remarkable achievements in child survival since 2000 in saving the lives of 48 million children under age five (UNICEF 2015: 6), progress has been insufficient to achieve MDG 4 worldwide. Notably, the
53% decline in U5MR globally is far from the two-thirds reduction required to meet the MDG 4 target. UNICEF (2015) reports that if trends reported as of 2015 continue, the world as a whole would reach the MDG 4 target in 2026, more than 10 years behind schedule (p. 6).

As the global community deliberates the Sustainable Development Goals (SDGs) – with a target year of 2030, it is uncontested that child survival remains an urgent concern. Sub-Saharan Africa still remains the region with the highest U5MR in the world, with 1 child in 12 dying before his or her fifth birthday. This rate is much higher than the average ratio of 1 in 147 in high-income countries. Globally, the neonatal mortality rate (NNMR) fell from 36 deaths per 1,000 live births in 1990 to 19 in 2015, and the number of neonatal deaths declined from 5.1 million to 2.7 million. However, the decline in neonatal mortality over 1990–2015 has been slower than that of post-neonatal under-five mortality (1-59 months): 47%, compared with 58% globally (UNICEF 2015:6). The first 28 days are critical for a child’s survival thereby making neonatal mortality increasingly prominent due to its increased share of under-five deaths occurring during the neonatal period. Further, most interventions aimed at improving survival during the neonatal period are different from those aimed at addressing other under-five deaths.

Against this background, the purpose of this paper is to examine the variations in wealth gaps in SSA and their association with neonatal mortality over time by using data from nationally representative population-based surveys conducted between 1990 and 2014. This assessment is inevitable since understanding the trends and contributing factors to the stalled progress is critical when planning effective interventions to reduce neonatal mortality and more important to achieve the SGDs.

Data and Methods
We plan to use data from the Demographic and Health Surveys (DHS) conducted between 1990 and 2014 which offer various indicators including neonatal mortality and wealth quintiles calculated using information on households’ assets and other possessions. The data are publicly available online through the DHS STATCompiler (www.statcompiler.com). The STATCompiler allows users to make custom tables based on hundreds of demographic and health indicators across more than 80 countries. As of September 2015, the database contained 330 surveys of which 133 surveys were in SSAa. Of the 133 SSA surveys, 10 had only a single survey. We finally use the 31 countries that had the earliest and most recent surveys (n=62) with neonatal mortality estimates provided by wealth quintiles. The use of earliest and most recent surveys also provides a reasonable length of time in order to observe reasonable changes. Time intervals between the two surveys across the 31 countries ranged from 5 to 23 years, averaging 13.7 years of observation time. The 62 surveys were conducted between 1990 and 2014.

Use of DHS data as with many other large-scale survey data has several limitations associated with sampling variability of the estimates and non-sampling errors. For example, non-sampling errors depends on the completeness with which child deaths are recalled and reported, the accuracy of the date of birth information reported by the mother for living children, and the accuracy of the age at death information given by the mother for the deceased children. Despite some of these challenges, which are often resolved through application of various demographic techniques, the DHS data have become a prominent source of data on health and other socio-economic data for many countries in the less developed world, and SSA in particular.

Dependent Variables
The main variable of interest is neonatal mortality rate (NNMR), defined as the probability of dying within the first month of life, and expressed per 1,000 live births. Our independent variable is wealth index, which is used as a proxy for measuring the long-term standard of living. In the DHS, the wealth index is calculated based on data from the household’s ownership of consumer goods; dwelling characteristics; type of drinking water source; toilet facilities; and other characteristics that are related to a household’s socio-economic status. The method of constructing this index has been documented in detail in various DHS country reports. In short, to construct the index, each of the assets is assigned a weight (factor score) by using principal components analysis, and the resulting scores are standardized in relation to a standard normal distribution with a mean of zero and standard deviation of one (Gwatkin et al. 2000).
Analyzing in equalities by using the wealth index is consistent with several studies that have documented the role of living standards on child survival (e.g. Gouda et al. 2015; Nattey et al. 2013).

Planned Analyses
We will use values of NNMR for all the quintiles in the earliest and recent surveys and then compare the top and bottom quintiles in the two sets of surveys to examine the gaps between the rich and the poor and its associated improvement. Despite some of the limitations of using the wealth index for cross-country comparisons (Rutstein and Staveteig 2014) since each wealth index is unique for each country, comparing the top and bottom quintiles is reasonable since the top and bottom ones include the extreme cases. That is, the wealth range within the top group can contain exceptionally well-off persons, and the bottom group can contain the most desperately poor (Ross 2015: 423). We also use the mean and median rates for each country and for all the countries combined. We will link the results of this analysis to the various interventions that have taken place since the 1990s to improve child survival in SSA and map out areas of successes and challenges.

Preliminary Findings
Neonatal mortality rates by wealth quintile
For all the 31 countries included in the analysis neonatal mortality rate (NNMR) slightly declined with increasing wealth during the initial surveys. For example, the NNMR was 44 deaths per 1,000 live births among households in the lowest quintile whereas it was 47 in the second quintile, 46 in the third quintile and a low of 42 and 34 deaths per 1,000 live births in the fourth and last quintiles, respectively. NNMR estimates from the latest surveys show a decline from the initial values for each quintile though the NNMR stabilized at around 33 deaths per 1,000 live births for the lowest through the fourth quintiles, with the lowest value observed in the highest quintile at 27 deaths per 1,000 live births (Figure 1).

The gap between the rich and the poor in NNMR has in fact declined over the years. In the initial surveys, the NNMR gap between the highest and the lowest quintile was 10 deaths per 1,000 live births (Figure 2). In the most recent survey rounds, the NNMR gap reduced by 4 points, for a 6 deaths per 1,000 live births difference between the highest and the lowest wealth quintiles.

The pace of decline in the 31 countries is also consistent with the general trend that has been reported by UNICEF’s 2015 Report on Child Mortality (Figure 3). The pace of decline is worrisome and we aim to explore these trends and map out successes and challenges that lie ahead based on an assessment of the recent past on the type and scale of interventions that have been deployed in SSA to improve child survival.
Conclusion

The general transition from high to low mortality in sub-Saharan Africa has been lauded as a success as countries took stock of the achievements made by the deadline of the MDGs in 2015. That child mortality has declined since 1990 is a clear message to the world that commitment, concerted efforts, and political will, among others, can lead to dramatic improvements in human survival. Despite these achievements there is a concern that some 69 million children are at risk of dying before reaching their fifth birthday in the next 15 years if the current trends continue without acceleration (UNICEF 2015: 9). We hope that this study will not only document inequalities in neonatal mortality but also provide a road map to ensure that the contribution of neonatal deaths to all under-five deaths is significantly reduced as the world embarks on a journey towards the Sustainable Development Goals.

References


