



FONDATION POUR LES ETUDES ET RECHERCHES SUR LE DEVELOPPEMENT INTERNATIONAL

## **Reconstruction of trends in annual Under-Five Mortality rates in sub-Saharan Africa: September 2010 update**

by  
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Policy Brief / 12 (Eng)  
September 2010

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Elle met en oeuvre avec la Fondri l'Initiative pour le Développement et la Gouvernance Mondiale (IDGM).

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Sub-Saharan countries began the health transition later than other countries. Most countries still have relatively low levels of life expectancy and high levels of infant and child mortality. To fairly judge the health transition in Africa and to identify gaps where further action is needed, it is appropriate to consider trends rather than simply current mortality indicators. This approach is particularly important for under-five mortality, the main target of public health policies and the most common indicator of levels of mortality. Under-five mortality is one of the eight Millennium Development Goals (Goal 4 and Target 4.A “Reduce by two thirds, between 1990 and 2015, the under-five mortality rate”). Progress in public health is monitored by three indicators, of which the under-five death rate.

Comprehensive registration data, the best source for assessing mortality trends, are currently not available in sub-Saharan Africa. To assess trends in mortality among young children, researchers rely on demographic sample surveys or other sources such as mortality data collected in censuses. A more recent analysis was conducted by the World Health Organization (WHO) using direct and indirect estimates, and reconstructing trends by five-year periods. This compendium made better use of all available data, in particular direct estimates provided by DHS surveys. However, it covers five-year periods, which provide reasonable estimates of mortality levels and major trends, but often obscure the specific periods when changes in mortality trends occur. Precise knowledge of the date of reversals in mortality trends is important to understand the causation of the changes.

This dataset presents a reconstruction of trends in annual under-five mortality rates for 37 SSA countries, covering about 95% of the SSA population. This reconstruction is based on annual data provided by the DHS (Demographic and Health Surveys) and WFS (World Fertility Surveys) in sub-Saharan Africa since 1950, wherever possible. These surveys use the same methodology: the collection of maternity histories from a representative sample of women of reproductive age (15-49 years).

In the first step, age- and period-specific death rates were calculated for each survey allowing to compute under-five mortality rates. In the second step, data from various surveys in the same country were aggregated after the surveys were examined for compatibility. In the third step, the authors searched for monotonic periods of mortality change (whether a declining, a steady or an increasing trend) and inflexion points where a change in slope occurred. The search for inflexion points was conducted graphically first, and then tested statistically using a linear logistic model. After monotonic periods were identified, trends could be formally calculated. This was done by considering the equivalence of period and cohort estimates and applying a Logit model.

Among the 37 countries studied, only 8 had monotonic or quasi-monotonic mortality trends, that is a smooth health transition. Another 8 countries had periods of major rise in mortality due to various causes, and in at least eight other countries mortality was rising in the most recent period, since 1985-1990 as a result of fast increasing HIV/AIDS mortality. Overall, results indicate that the health transition in sub-Saharan Africa has progressed during the second half of the twentieth century, though at a lower speed than could have been expected, with an average of  $-1.8\%$  of mortality decline per year. Furthermore, the transition has been chaotic in more than half the countries, and cases of reversals in mortality trends seem to be linked to a variety of causes: political crises, economic crises, and epidemiological crises, most of them due to HIV/AIDS in the recent period.

To show the possible role of HIV/AIDS, we developed a projection model of the expected impact of AIDS in under-five mortality. This model is based on very inaccurate data

of HIV prevalence among pregnant women. This part should therefore be considered with the greatest caution. Only South-Africa has a complete annual series of HIV prevalence since 1990. However, our model produced a reasonable estimation of the role of HIV/AIDS in under-five mortality. For the whole of Africa, AIDS mortality accounts for about 12% of the total of under-five mortality between 2000 and 2005, with large variations between countries. It should be noted that this proportion is likely to decline in the future because of the prevention of mother to child transmission and because of anti-retroviral therapies.

The same method was applied to the urban and rural areas, as defined in demographic surveys. Results show a marked excess rural mortality of about 40%, again with large variations by country. Excess rural mortality tended to increase between 1965 and 1985, then to decrease between 1985 and 2005.

Quantity and quality of data vary strongly between countries. Some have an abundant documentation, with precise and consistent data which allow to reconstruct a complete series between 1950 and 2005 with a small confidence interval. Others have very erratic data (as Nigeria), or very incomplete data (as Burundi and Sudan). In some cases we supplemented DHS data with data from recent censuses and surveys (in particular MICS surveys) in order to complete the available series up to 2005 or in the 1950's.

The method has been presented in details in:

Garenne M. and Gakusi E. (2005), Under-five mortality trends in Africa: Reconstruction from Demographic Sample Survey, DHS Working Paper n°26. Available on [www.measuredhs.com](http://www.measuredhs.com)

In the case you use the data, recommended quotation is:

Garenne M and Gakusi E (2009), Reconstruction of Under-Five Mortality Trends in Sub-Saharan Africa: 2009 Update. Foundation for Studies and Research on International Development. Available on web site: <http://www.ferdi.fr>