

## Reconstruction of fertility trends in urban and rural areas of sub-Saharan Africa since 1950 (2010 update)

Michel GARENNE

 MICHEL GARENNE is researcher at the Emerging Diseases Epidemiology Unit at Pasteur Institute. He is member of the Scientific Council of the Institute of Tropical Medicine (University of Heidelberg) and author of numerous publications on population and public health in Africa.  
**contact** [michel.garenne@pasteur.fr](mailto:michel.garenne@pasteur.fr)

In a natural fertility regime, that is without family limitation, the level of fertility is fixed mainly by biological factors, such as sterility, duration of birth intervals, breastfeeding, nutrition, etc. It sometimes also depends upon behavioral factors, such as marriage (age at first marriage, proportion remaining single), which may be affected by economic fluctuations.



•••/••• With economic development, some of the biological constraints may change over time (such as improving nutrition, decreasing sterility), which may induce fertility increases. More important, behaviors tend to change eventually, at various speeds, as a result of emerging cash economy, of urbanization, of modern education, as well as with emerging new family models. Furthermore, family planning programs may facilitate, and sometimes induce these changes, by giving women access to new methods of contraception, modern and efficient, and often free of charge or at a minimal cost.

To study the impact of these various factors, it is important to firstly document fertility trends in details. This is an easy task in countries well covered by vital registration, and with complete registration of births. But this task is much more difficult in countries where no regular and exhaustive statistics are available.

As far as sub-Saharan Africa is concerned, demographic data on levels and trends in fertility come primarily from demographic sample surveys, which are the most reliable sources, and from censuses when these include fertility questions (children ever born, or births in the past 12 months). However published data based on these sources provide only point estimates at time of the survey, and not complete time series.

The aim of this study was to reconstruct trends in period fertility, year by year, from demographic survey data. The sources of data are the surveys belonging to the large international survey programs: the World Fertility Surveys (WFS) and the Demographic and Health Surveys (DHS).

The method to reconstruct trends is based on maternity histories, which provide births from interviewed women by date of birth. This allows one to compute age specific fertility rates and cumulated fertility between age 12 and 40 for the 10 years preceding the survey. Trends in cumulated fertility are then analyzed with a linear regression model, and slopes are tested statistically. Significant changes in slopes are

identified. One can therefore reconstruct fertility trends over monotonic periods, which may be long term periods when several surveys are available in the same country. Cumulated fertility by age 50, also called the Total Fertility Rate (TFR) can be calculated simply by applying a constant coefficient of 1/0.90, since about 90% of births to women occur before age 40 years. Our indicator of fertility is computed over the 1950-2008 period using 99 surveys for a set of 35 African countries in 2010, covering more than 90% of the population of sub-Saharan Africa.

Results of this reconstruction indicate that, in a first period, fertility increased, from about 5.6 children per woman in 1950 to 6.9 children per women around 1980, mainly because of declining sterility. Then it started to decline thereafter, to reach 5.4 children per woman in 2005.

More important, the fertility decline was particularly pronounced and fast in urban areas, where it went from a peak of 6.0 children per woman around 1977 to 4.0 children per woman in 2005. Roughly speaking, this means half a fertility transition in a generation, and suggests that the whole fertility transition is likely to occur within two generations, or 60 years. This speed of transition compares with the average speed found in many countries around the world. All countries investigated had some kind of fertility decline in urban areas at the time this study was completed. Some countries had ever reached- or passed below- replacement fertility, in particular in large cities and in capital cities.

In rural areas, fertility changes were more contrasted. Altogether, fertility declined from a peak of 7.2 children per woman reached around 1982. This fertility decline occurred somewhat later, and was not as fast as in urban areas. However, it was already occurring in a majority of countries, and seemed to be continuing, with only a few exceptions. However, fertility remained very high, and sometimes was still rising in rural areas of 9 countries. In these cases, the date of onset of the fertility transition remains unknown.

One could note that fertility trends in Africa appeared paradoxical when compared with trends in income per capita: fertility increased when GDP per capita increased, as during the 1950-1975 years, then declined when GDP per capita declined, as during the 1975-1995 years. Indeed, the first period is characterized by improving health and nutrition, whereas the second period is dominated by the development of family planning programs. Furthermore, fertility continued to decline on the same path between 1995 and 2005, when economic growth was catching up and income per capita increased, again because of improvements in modern contraception. The analysis of relations between economic development and fertility trends is therefore complex, and requires that health and demographic policies be taken into account.

The method of the study is presented in details in the following documents:

- **Garenne M.** (2008). Fertility changes in sub-Saharan Africa. *DHS Comparative Report*, No 18. Calverton, Maryland, USA: Macro International Inc. 128 p.
- **Garenne M., Joseph V.** (2002). The timing of the fertility transition in sub-Saharan Africa. *World Development*, 30(10): 1835-1843.

Original survey data are available from Macro International Inc, at the following web site:

[www.measuredhs.com](http://www.measuredhs.com)

Recommended citation, if you use this data set:

- **Garenne M.** (2010). Reconstruction of fertility trends in urban and rural areas of sub-Saharan Africa since 1950 (2010 update)", *Ferdi Policy Brief B14*.  
Data available at [www.ferdi.fr](http://www.ferdi.fr)



Créée en 2003, la **Fondation pour les études et recherches sur le développement international** vise à favoriser la compréhension du développement économique international et des politiques qui l'influencent.



### **Contact**

[www.ferdi.fr](http://www.ferdi.fr)

contact@ferdi.fr

+33 (0)4 73 17 75 30

