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Explaining differences in the projected populations between the 2012 and 2010 Revisions of *World Population Prospects*: The role of fertility in Africa

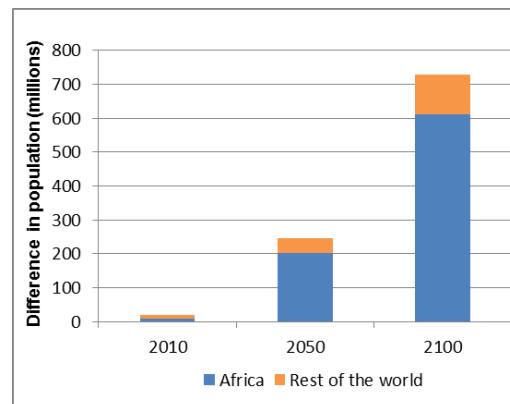
1. Every two years, the United Nations Population Division revises its population estimates and projections for all countries and areas of the World. Known as *World Population Prospects*, the data included in these publications are based on the latest empirical evidence gathered and estimated from available survey and census operations as well as from vital registration systems. The incorporation of new data in the *2012 Revision* enabled demographers in the Population Division to revise the estimate of the current population of all countries of the world as well as the levels and trends in each population component (i.e. fertility, mortality and migration).

2. The 2012 Revision of *World Population Prospects* drew on new empirical evidence on fertility levels and trends that became available since the 2010 Revision.¹ The empirical evidence from available surveys and the 2010 round of population censuses, as well as the application of new estimation methods to existing datasets, provided a basis for a reassessment of national fertility levels and recent trends. This indicated slower declines than previously expected in several countries and even some stalling or stagnation in others. These findings have important implications for the size of projected future populations.

3. According to the 2012 Revision of the *World Population Prospects*, the current population of the World is 7.2 billion and will increase to 9.6 billion by 2050 and 10.9 billion by 2100. Compared to the *2010 Revision*, the new projections of future population have been revised upwardly. According to the medium-variant projection in the *2012 Revision*, world population will be 0.3 billion larger in 2050 (9.6 billion versus the earlier projection of 9.3 billion) and 723 million larger in 2100 (10.9 billion versus 10.1 billion). Over 80 per cent of the increase in the projected overall population size, whether by 2050 or 2100, will be absorbed by Africa (figure 1). The higher projections for future global population are due in large part to the adjustments made in the estimates

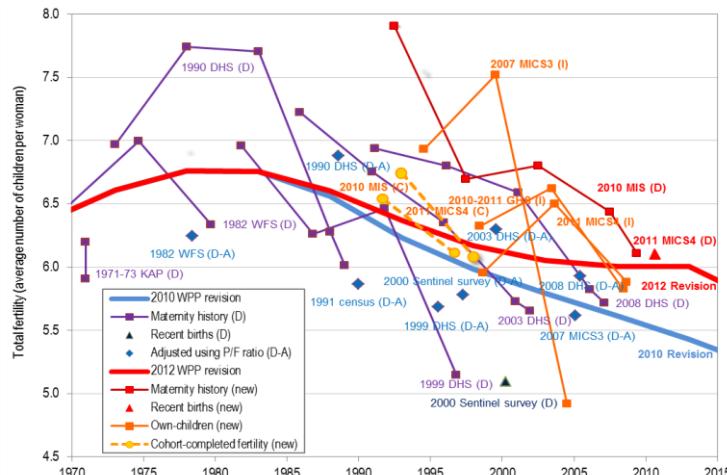
of current fertility levels, mainly in Africa, which have resulted from the incorporation of new data. The fertility level of Africa as a whole in 2005-2010 was increased by 5.2 percent between the two revisions or by 0.24 children per woman.

Figure 1. Differences in the estimated and projected populations between the 2012 and 2010 Revisions, Africa and rest of the world, 2010, 2050 and 2100



4. The estimated level of fertility was adjusted upward by more than 5 per cent in 15 African countries with total fertility rates of 5 children per woman or more. In Burundi, the country with the largest increase, the average number of children per woman was adjusted by 40 per cent, while an increase of just over 5 per cent was estimated in both Mali and Niger. In Nigeria, the country with the largest contribution to the future population of Africa, the adjustment made to the average number of children per woman was the by-product of the availability of new data sources (2010 Malaria Indicator Survey, 2010-2011 General Household Survey (GHS), 2011 Multiple Indicator Cluster Survey (MICS)) and the application of new estimation methods to existing data sets (see figure 2). As seen in the figure, the new data sets labelled in red and orange, which were also used to revise the estimate of the baseline population, are responsible for the upward adjustment of the time-series on total fertility.

Figure 2. Total fertility estimates for Nigeria: empirical data and estimates from the 2010 and 2012 Revisions

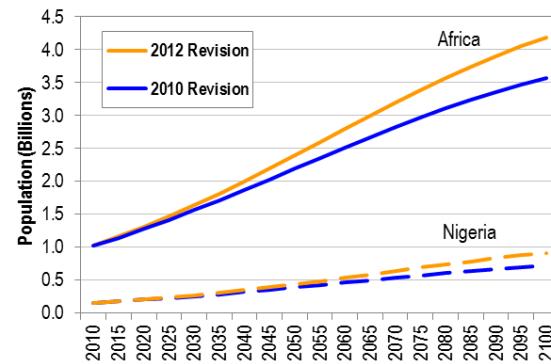


5. To project future trajectories of the number of children per woman, the Population Division relies on a probabilistic method based on empirical fertility trends estimated for all countries² of the world for the period 1950 to 2010.^{3,4} Depending on a country's fertility level, two distinct processes are employed to project the future course of total fertility. The first process is applied to countries that have not achieved their demographic transition and models the sequence of change from high to low fertility. The second process deals with countries once they have completed the demographic transition, and have reached low fertility levels.

6. The upward adjustments made to the total fertility rate in Africa affected both the estimates of current population size and projected future populations at the national, regional and world levels. Because the average number of children per woman at the start of the projection period in Africa was increased (by about a quarter of a child), the future projected trajectories of total fertility rate were also affected. By 2045-2050, the difference in the projected total fertility rate in Africa between the two recent revisions reached 0.2 children per woman. The cumulative effect of slightly higher fertility will play out over several decades and was responsible for the significant upward adjustments in the projected population size of certain countries between the two revisions. In conjunction with the projected improvement in mortality, these changes were sufficient to project an additional 0.6 billion people in the region by 2100. Nigeria alone accounted for 30 per cent of that increase (figure 3).

Lastly, slight modifications in the projected fertility trajectories of some very populous countries also yielded important differences in other countries which affected the global population forecasts. Overall, future levels of

Figure 3. Projected populations of Africa and Nigeria, 2010 Revision and 2012 Revision, 2010-2100



life expectancy at birth were slightly higher in several countries within this latest revision; longer survival, like higher fertility, contributed to larger projected populations. Finally, a small portion of the difference between revisions was attributable to changes introduced in the projection methodology for this revision.

NOTES

¹ United Nations (2013), *World Population Prospect: The 2012 Revision. Data Sources and Meta Information*, New York, Department of Economic and Social Affairs, Population Division, available online at: <http://esa.un.org/unpd/wpp/sources/country.aspx> and http://esa.un.org/unpd/wpp/Excel-Data/WPP2012_F02_METAINFO.xls

² Only countries or areas with 90,000 persons or more in 2013 are considered.

³ Or up to 2010-2015 for 37 countries with empirical data up to 2011 or 2012.

⁴ Alkema L., A.E. Raftery, P. Gerland, S.J. Clark, F. Pelletier, T. Buettner, G.K. Heilig (2011), "Probabilistic projections of the total fertility rate for all countries", *Demography*, vol. 48, number 3, pp. 815-839, doi: 10.1007/s13524-011-0040-5 and *Working Paper of the Center for Statistics and the Social Sciences*, University of Washington, 2010, vol. 97.

URL <http://www.csss.washington.edu/Papers/wp97.pdf>; Raftery, A.E., L. Alkema, and P. Gerland (2013), "Bayesian population projections for the United Nations", *Statistical Science*. In press. http://www.imstat.org/sts/future_papers.html