

# **Bayesian Weighted Regression Approach for Modelling Fertility Level in Nigeria**

**By**

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## **Summary**

Interest on determinants of fertility has continued to attract the attention of researchers/policymakers. Fertility levels in sub Saharan Africa are still among the highest in the world despite the current global fertility transition. This is because until recent, many African nations have been resistance to the biological and behavioural change that could result in the downward shift. As a consequence, interest on determinants of fertility in the region has continued to attract the attention of researchers and policymakers. The Federal Government of Nigeria having recognized that population factors, environmental issues and social and economic developments are irrevocably interconnected and are critical to the achievement of sustainable development which in turn can lead to the country's attainment of the Millennium Development Goals (MDGs), namely, eradicating extreme poverty (MGD 1); achieve universal education, (MDG 4); reduce child mortality (MGD 4); improving maternal health (MDG 5) and combat HIV/AIDS and other disease (MDG 6), came up with a National Policy on Population for Sustainable Development in 2005.

An assumption often made in data analysis is that each data point provides equally precise information about the total variation. Whenever it is not reasonable to assume that every observation should be treated equally, weighted least squares may provide optimal efficiency of parameter estimation. To further explore possible determinants of fertility at state level in the presence of geographical variations, this paper uses a geographically weighted regression approach – a novel approach that simultaneously estimates the spatial distribution that accommodates neighbourhood effect, nonlinear effect of metrical covariates, fixed effect of categorical covariates, and smoothing parameters at a step through a Bayesian approach. The procedure utilizes information on the total number of respondents over which the mean estimate per state is obtained.

In this paper, Bayesian weighted regression approach was used to model determinants of fertility based on the 2008 Nigeria DHS data. Appropriate priors are assumed on functions and parameters. Space-varying effect of urbanisation was also incorporated into the predictor. Findings reveal substantial geographical variations in fertility with a clear North-South divide. Analyses were carried out with BayesX – a software for structured additive regression models.