AGE-SPECIFIC FERTILITY DYNAMICS: SUB-SAHARAN AFRICAN FERTILITY IN A GLOBAL CONTEXT


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Persistent high fertility in sub-Saharan Africa has been of concern to demographers and global health experts for decades. Sub-Saharan African fertility levels and trends are singled out as markedly higher and different than the rest of the world and from what is expected based on historic fertility trends. Global population projections, which indicate continued population growth in sub-Saharan Africa while population stabilizes and declines elsewhere brings renewed focus on African fertility. This dissertation seeks to address some of the challenges to understanding modern fertility regimes and fertility dynamics posed by persistent high fertility in sub-Saharan Africa by examining it in a global, demographic context.

Population measures of sterility are traditionally constructed for women, despite fertility and sterility being conditions of the couple. Estimates of male sterility provide insight into population-level sterility and complement estimates based solely on women. Chapter 2 seeks to estimate male sterility for the Gwembe Tonga of Zambia using male birth histories collected by the Gwembe Tonga Research Project from 1957 to 1995, while providing context by estimating female sterility for the Gwembe Tonga as well as female sterility in all of Zambia from Zambian DHS data (1992, 1997, 2001-02, and 2007). Sterility is measured using the Larson-Menken subsequently infertile indicator. Estimates are produced using discrete time event history analysis. The odds of sterility were higher for women than men, though women's odds of sterility were only 1.5 times that of men's in the middle reproductive years. The odds of sterility increased steadily with age for both men and women, and across all datasets. However, women's sterility increased much more sharply with age than men's and women's odds of sterility were higher than men's at all reproductive ages.

Chapter 3 aims to understand trends in global fertility from 1950-2010 though the analysis of age-specific fertility rates. This approach incorporates both the overall level, as when the total fertility rate is modeled, and different patterns of age-specific fertility to examine the relationship between changes in age-specific fertility and fertility decline. Singular value decomposition is used to capture the variation in age-specific fertility curves while reducing the number of dimensions, allowing curves to be described nearly fully with three parameters. Regional patterns and trends over time are evident in parameter values, suggesting this method provides a useful tool for considering fertility decline globally. The second and third parameters were analyzed using model-based clustering to examine patterns of age-specific fertility over time and place; four clusters were obtained. A country's demographic transition can be traced through time by membership in the different clusters, with regional patterns in the trajectories through time and with fertility decline.

Generally determinants of fertility decline are hypothesized to encourage declines at specific ages as a result of the mechanisms by which these determinants exert influence on fertility. Using the reduced parameterization of age-specific developed in this dissertation, Chapter 4 aims to examine the association of determinants of fertility with age-specific fertility curves to test hypotheses regarding how determinants of fertility decline are associated with age-specific fertility. Results of this analysis corroborate predictions made in the literature about how age-specific fertility is affected by mortality, development, HIV prevalence, women's empowerment, contraception use and urbanization. However, some hypotheses were not born out, notably the association between low mortality and stopping behavior. The evidence indicates that these relationships are not uniform across world regions and that these relationships are different across world regions.

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