# A Bayesian Model to Estimate Male and Female Fertility Patterns at a Subnational Level

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## Short Abstract

Accurate subnational fertility estimates are crucial for shaping policy decisions across diverse sectors, including education, health care, and social welfare. One of the major challenges in producing these estimates is the presence of small populations, in which information about birth counts stratified by the age of the parent at the birth of the child may be lacking or inadequate. In this research paper, we describe a Bayesian model tailored to estimate the period Total Fertility Rates (TFR) for both men and women at a subnational level. Building on previous work by **?**, the model utilizes population counts from age-sex pyramids and models age-specific mortality and fertility patterns allowing for uncertainty. We present a real data application focusing on fertility estimation in US counties for the historical period $1982 - 2019$. Preliminary results reveal distinctive fertility trajectories for men and women across different US counties. Furthermore, the proposed model exhibits significant potential for the examination of male and female fertility behaviors across diverse regions and time frames in multiple countries.