Study on human fertility models find those based on economics the most reliable

30 April 2013, by Bob Yirka

(Phys.org) —A team made up of American anthropologists and zoologists along with a demographer from Bangladesh has been comparing various models that have been developed over the years to explain population growth, and has found that those based on economics appear to be the most reliable. In their paper published in the *Proceedings of the National Academy of Sciences*, the team explains that by examining data collected through various studies and interviewing women in Bangladesh, they've found that economic fertility models appear to best reflect the reality of population growth.

Over the years anthropologists, zoologists, demographers and various other researchers have put forth theories that seek to explain the drivers of fertility rates among human populations. In this new effort, the researchers explain that past research has resulted in three major types of models being developed that purport to explain fertility rates. The first is based on risk and mortality theories. These models are based on infant mortality rates—as rates fall, population rises, but only temporarily—they soon fall as parents come to realize that the children they have will very likely live. The second group of models is based on economic and investment theories—they suggest fertility rates are based on economic conditions, such as how well a family is doing overall, or how many children a family will have if they live on a farm and plan to use the children as a labor force. The third group of models is based on cultural transition theories. Here the thinking is that fertility rates are based on cultural norms, or practices, such as the use of birth control.

After analyzing data obtained from a myriad of studies done over the years by various researchers, the team working on this new effort moved their focus to an area of Bangladesh that has seen a very dramatic drop in fertility rates —down to 2.6 from 6.7 over the period 1966 and 2010. To find out why it occurred, the team interviewed 799 women (aged 20 to 64) that lived in the area and who had been married for at least five years. The researchers found that the overriding factor was economics. Women that moved to cities and earned more money had fewer children (they also had more education).

Tying together their analysis of the various fertility models with the study done in Bangladesh, the researchers have concluded that those models that are based on economics are most likely to represent true fertility rate dynamics as they occur in the real world.

More information: A model comparison approach shows stronger support for economic models of fertility decline, Published online before print April 29, 2013, doi: 10.1073/pnas.1217029110

Abstract

The demographic transition is an ongoing global phenomenon in which high fertility and mortality rates are replaced by low fertility and mortality. Despite intense interest in the causes of the transition, especially with respect to decreasing fertility rates, the underlying mechanisms motivating it are still subject to much debate. The literature is crowded with competing theories, including causal models that emphasize (i) mortality and extrinsic risk, (ii) the economic costs and benefits of investing in self and children, and (iii) the cultural transmission of low-fertility social norms. Distinguishing between models, however, requires more comprehensive, better-controlled studies than have been published to date. We use detailed demographic data from recent fieldwork to determine which models produce the most robust explanation of the rapid, recent demographic transition in rural Bangladesh. To rigorously compare models, we use an evidence-based statistical approach using model selection techniques derived from likelihood theory. This approach allows us to quantify the relative evidence the data give to alternative models, even when

model predictions are not mutually exclusive. Results indicate that fertility, measured as either total fertility or surviving children, is best explained by models emphasizing economic factors and related motivations for parental investment. Our results also suggest important synergies between models, implicating multiple causal pathways in the rapidity and degree of recent demographic transitions.