Socioeconomic inequalities in fertility in three rural districts of Tanzania. New evidence from a longitudinal study in rural Tanzania

Malick Kante1,2, Elizabeth Jackson, Rose Nathan, Mrema Sigilbert, Francis Levira, James F. Phillips

Abstract

Researchers have intensively demonstrated the socioeconomic inequalities in fertility everywhere in the World. There are however limited researches on the causal effects of distance to facilities on fertility. This paper uses unique longitudinal data collected in three rural districts of Tanzania to test whether enhanced proximity to health services can reduce inequalities in fertility between rich and poor. Data on births, deaths, migrations, SES and geographic data on households and facilities have been recorded every 120 days since 1999 ($n \approx 200,000$). We will use multivariate analysis to measure the causal effects of distance to health facilities on fertility and to test interactions between distance to health facilities and maternal education and households’ SES. Initial results indicate that, from 2000 to 2010, TFR remains high around 5.3 births per woman with significant differences between poor (6.4) and rich (3.4) and between educated (2.9) and not educated (5.9). The distance to the closest health facility remained a strong determinant of fertility, even after adjusting for endogeneity biases. The development of community-based primary health care can improve health outcomes and can increase equity by offsetting the detrimental effects of low maternal education, household poverty and distance to health facilities.

Background

Since 2000, global health initiatives and resources for health have increased sharply which has increased coverage of health interventions several countries (Horton, 2006). As the result, health indicators have been improved in most of developing countries. However, sub-Saharan Africa has still high level of fertility compared with other developing regions (United Nations, 2012). However, the social, demographic and residential inequalities in child mortality remain considerable in most of Developing countries. The socioeconomic inequalities in fertility have been documented in many studies. The relationship between socioeconomic status (SES) and fertility is strongly significant with a high fertility rate frequently concentrated in the worse-off. These inequalities exist according to all measures of socioeconomic status; household wealth or income, maternal education, social class as well as geographical setting. Paradoxically, the impact of distance to health facility and socio-economic status on fertility trends in sub-Saharan Africa has rarely been studied. This paper proposes to extend this proposition by examination the role of SES of the household on fertility trends in Tanzania.

1 Mailman School of Public Health, Columbia University, New York, USA
2 Ifakara Health Institute, Dar es Salaam, Tanzania
Objective

This paper measures the level and analyses trends and determinants of fertility rates in rural Tanzania from 2000 to 2010. The analysis aims to clarify the role that the education of woman, the SES of household and the proximity to health facilities have played in explaining the inequalities of fertility over a decade of surveillance and also to elucidate interaction of proximity with social determinants of fertility.

Data and method

Ever since 1996, the Ifakara Health Institute has maintained an integrated health and demographic surveillance system (HDSS) in three rural districts of the Coastal and Morogoro regions (Rufiji, Kilombero and Ulanga). Since then, household information (birth, union, migration, death and causes of death…) is updated through regular visits, whereby each household is visited thrice (once in every four months) a year in three rounds. Data on social and economic characteristics that define health equity have been compiled in HDSS areas over time, once a year (Schellenberg, 2001; Mwageni, 2002).

The SES index was constructed using the principal component analysis proposed by Filmer and Pritchett, (2000) and was derived from several variables, comprised of household assets (e.g., television, radio, refrigerator, etc), housing characteristics (quality of household materials), and sanitary amenities (e.g., water supply and toilet).

We draw the general trends of fertility and examine separately the existence of relationships between age and education of woman, households (SES and distance to health facilities) and the fertility rates (univariate analysis). Then, using multivariate logistic regressions we control effects of significant variables in the univariate variables to determine factors of high fertility rates.

Preliminary analyses and timetable

The annual TFR remained high - more than 5 births per woman between 2000 and 2008, then the trends showed a modest decline during the more recent years; the TFR is around 4.6 births per woman in 2009 and 4.8 in 2010. However, the general decline of fertility seems started since 2005 where the TFR was the highest during our reference period 6.0 births per woman. The average TFR for the period 1999-2009 is 5.3 births per woman (fig 1).

The age-specific fertility rates show that young women (15 – 19 years old) have high fertility. The highest fertility is for women 20-24 (25 per 1,000) then the fertility rates declined progressively by age group (fig 2).

---

3 One round = four (4) months long for both Ifakara HDSS and Rufiji HDSS
The preliminary results show also that between 2000 and 2010, the poorest households (first quintile) have very higher fertility, 6.4 births per woman compared to other quintiles. The lowest TFR has been recorded for richest households, only 3.4 births per woman (tableau 1). Also, poorest households recorded the highest fertility rates for each age-group compared to other wealth quintiles (fig 3).

For mother’s education, not educated woman have high fertility (5.9 births per woman) compared to educated woman (at least secondary level), only 2.9 births per woman (tableau 2). The age-specific fertility rates show very higher fertility for young not educated woman (15-19 years old), 18 births per 1,000 compared to young educated women, only 4 births per woman. For other age groups, the fertility rates remained twice more high for not educated women compared to educated women (fig 4).

Other data analysis including other proximate determinants (age of first birth, marital age, marital status, distance from household to nearest health facility providing family planning services) is ongoing. Preliminary analyses (multivariate analysis) will take about two months. We expect the proposed manuscript to be ready in April 2013.

Figure 1: Trends in total fertility rate (TFR) in Ifakara and Rufiji Health and Demographic Surveillance Systems, 2000 – 2010
Figure 2: Age-specific fertility in Ifakara and Rufiji Health and Demographic Surveillance Systems, 2000 – 2010

Figure 3: Age-specific fertility by household’s socio-economic status in Ifakara and Rufiji Health and Demographic Surveillance Systems, 2000 – 2010
Figure 3: Age-specific fertility by mother’s education attainment in Ifakara and Rufiji Health and Demographic Surveillance Systems, 2000 – 2010
Tableau 1: Total fertility rate (TFR) by household’s socio-economic status in Ifakara and Rufiji Health and Demographic Surveillance Systems, 2000 – 2010

<table>
<thead>
<tr>
<th>Socioeconomic status (SES)</th>
<th>Poorest</th>
<th>second</th>
<th>Third</th>
<th>Fourth</th>
<th>Richest</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fertility rate (TFR) (birth per woman)</td>
<td>6.35</td>
<td>6.02</td>
<td>5.5</td>
<td>4.83</td>
<td>3.38</td>
<td>5.26</td>
</tr>
</tbody>
</table>

Tableau 2: Total fertility rate (TFR) by mother’s education attainment in Ifakara and Rufiji Health and Demographic Surveillance Systems, 2000 – 2010

<table>
<thead>
<tr>
<th>Mother’s education attainment</th>
<th>Unknown</th>
<th>No education</th>
<th>Primary</th>
<th>Secondary and plus</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fertility rate (TFR) (birth per woman)</td>
<td>6.8</td>
<td>5.89</td>
<td>4.94</td>
<td>2.91</td>
<td>5.26</td>
</tr>
</tbody>
</table>