Title: Education and urban-rural differentials in fertility in developing countries – does residence matter?

Introduction

Fertility in developing countries has been decreasing over time; however, the pace of decline differs by the urban or rural place of residence (Lerch, 2019) and women's education (Basu, 2002; Lerch, 2019a)). Fertility levels tend to be lower in urban areas, and educational attainment is closely associated with lower fertility. This relationship is consistent and strong, particularly in developing countries which are the focus of this analysis. Demographers have long recognised the link between education and fertility within the broader framework of social and behavioural determinants of fertility. Bongaarts (2013) concluded that educational attainment is negatively associated with fertility and desired family size and positively associated with contraceptive use: "As education rises, fertility is lower at a given level of contraceptive use, contraceptive use is higher at a given level of demand, and demand is higher at a given level of desired family size". Other studies have supported the link between education, female autonomy and fertility (Cleland, 1996; Jejeebhoy, 1995). However, (female) access to education and birth control may not be the same in urban and rural areas. These inequalities, along with cultural differences, would be consequential for fertility trends in these settings.

Lerch (2019) identifies an inverted U-shaped rural-urban fertility ratio starting from the onset of the national fertility transition in developing countries. This pattern resembles the evolution of educational differential in fertility identified by previous empirical studies using DHS data(Casterline, 2017; Potančoková & K. C., 2012) and may be linked to educational disparities between urban and rural areas. However, Lerch's analysis hasn't incorporated the educational effect on fertility. We introduce education into the analysis of urban-rural difference in TFR and examine in comparative perspective the existence of fertility differential by education between urban and rural areas. Descriptive analysis investigates the gap in education-specific fertility between urban and rural areas and looks at the change over time. Is fertility in rural areas consistently higher at a given educational level, and does this difference persist?

In the second part, we ask whether this rural-urban fertility difference is attributable to the uneven composition of women's socio-economic characteristics and other contextual factors in a different residential context.

Aim of the Analysis

- To analyse the direction and magnitude of education-specific rural-urban fertility differences, check whether the urban-rural fertility difference is linked with educational disparities for developing regions; from the fourth wave of the DHS.
- To investigate the trend of education-specific rural-urban fertility differences to see whether it support Bongaarts's proposed leader-follower model or permanent difference model.
- To examine whether the rural-urban fertility difference attributed to the compositional and contextual characteristics.

Data

We are using all available DHS data from 1980 to 2020. We classify the survey data into four waves. Data collected between 1980 to 1990, 1991 to 2000, 2001 to 2010 and 2011 to 2020 will be considered the first, second, third, and fourth wave. These pooled data are used in a cross-sectional analysis of fertility differentials. We explore the trend over time using a subset of 30 countries with available time series of at least four waves of DHS. Education is harmonised into six educational categories based on ISCED 2011 classification (no education, primary, incomplete secondary, secondary and higher) by combing information about the highest educational level attained and highest grade attended. For the urban and rural region, we have used the same country-specific definition of DHS data. DHS has divided all countries into six macro-regions, and we have presented our result at this regional level.

Method

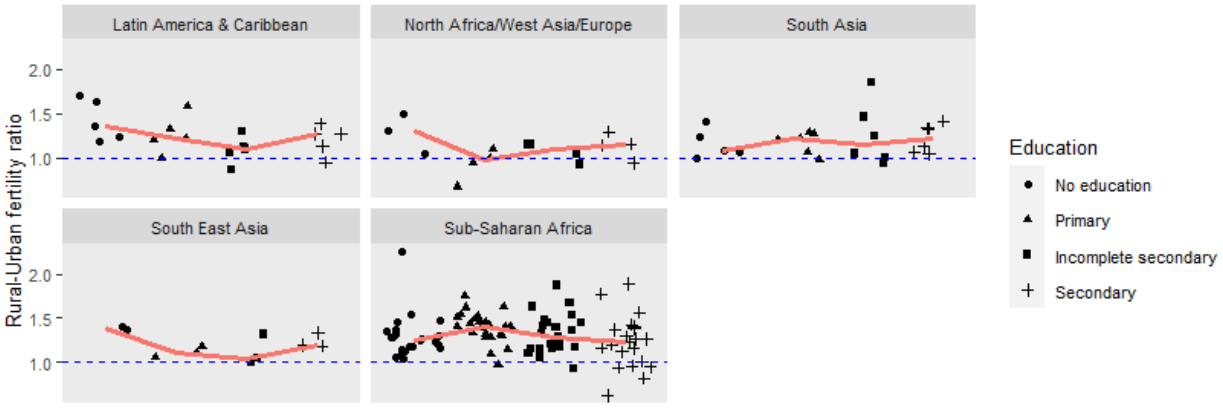
- Estimation of education-specific TFR for both urban and rural region for each countries using birth histories
- Estimating the ratio of education-specific urban TFR to rural TFR for each country.
- Exploring the pattern of education-specific rural-urban fertility difference of the countries which have the data of at least four waves.
- Averaging the fertility ratio of all countries within each region.

- Fitting a Multilevel regression model for each region by incorporating the common contextual factors such as Educational composition, contraceptive prevalence, and other demographic and socio-economic characteristics (age, education, parity, cohabitating duration) of women.

Preliminary results

In this section, we present only the preliminary descriptive results from our fourth wave data, i.e. for the most recent period 2011-2020. We found excess rural fertility for all countries under study. However, when we disaggregate the rural-urban fertility ratio by education, excess urban fertility is also seen in some countries, among higher educated women (like in Guinea,Togo). We have seen the robust negative association of women education with fertility in urban areas, but in rural areas, women with above secondary education levels have slightly higher fertility than women with below secondary level of education. Figure 1 plots rural-urban fertility ratio by educational levels and countries are classified in 5 regions. Values greater than 1 indicate higher fertility in rural areas and we find that this holds nearly universally.

Figure 1: Education-specific rural-urban fertility ratio



Source: own calculations on DHS data

We find a U shaped average rural-urban fertility ratio with differential education except in SSA, a region with highest TFR levels. Unlike other regions, we see an inverted U-shaped pattern in SSA. The pattern of south Asian countries is not entirely clear.

The trend analysis, which uses time series from 1980 to 2020, will examine country-specific trajectories of the differentials and will investigate whether we find support for Bongaarts's proposed leader-follower model vs. permanent difference model (Bongaarts 2003) when looking at urban and rural settings.

To test our assumption of whether rural-urban fertility difference is a compositional effect or not, we run a preliminary analysis for India. We have seen an insignificant impact of rural and urban residence on fertility while controlling the socio-economic characteristics of women and the contextual effects, and we expect to find a similar result at the regional level.

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