SOURCES OF FERTILITY DECLINE IN SOUTH ASIA: A REGIONAL ANALYSIS

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Rationale

Many aspects of the ongoing fertility decline in the populous South Asian countries -- Bangladesh, India, and Pakistan -- have been well-documented in the successive cross-sectional fertility surveys conducted during the past twenty years. Indeed, few regions are as rich in demographic survey data. From these data it is clear that South Asia is a highly differentiated, and highly stratified, region. There is a multiplicity of reproductive regimes in the sub-continent, not only across countries but within countries as well. These variations can be seen in India -- from replacement level fertility in the southern states to a much higher fertility rates in the northern states. And in Pakistan -- from major urban populations (Karachi, Lahore) where fertility is above replacement level but diverged from traditional high levels some time ago to extensive rural populations where reproductive attitudes and behaviors resemble those found in high fertility societies such as neighboring Afghanistan.

While the documentation of fertility decline in South Asia is extensive, in our view the perspectives from which scholars have viewed the decline have been limited, with a few important exceptions in the literature (Basu 2002, Basu and Amin 2004, Ramesh 2001, Sathar and Phillips 2001). Habits in the analysis of the readily-available survey data – for example, the choice of socioeconomic variables and categories – have set constraints on what the data are permitted to reveal. Our aim in this research is to cast new light on the process of decline during the past two decades by examining sub-regional patterns, and by focusing on the distinction between wanted and unwanted fertility. The former is the first, and higher, priority: we approach the South Asian fertility decline from a comparative perspective that downplays national boundaries and instead probes distinctive sub-regional clusterings that cohere with long-standing economic, social, and cultural legacies. In so doing, we expect to identify unrecognized sub-regional patterns and to explore further already-recognized sub-regional patterns, in particular Bengal (see Basu and Amin 2004) and Punjab. We also gain further insight into the South Asian decline by investigating the relative contributions to the decline of changes in the demand for children as against changes in the extent to which fertility demand is achieved, and by investigating the relative contributions of nuptiality (heavily conditioned by social and cultural factors) as against marital fertility. Neither of these perspectives – sub-regional patterns, wanted vs. unwanted fertility vs. nuptiality – has been featured in most recent research on reproductive change in South Asia (although, as already noted, sub-regional patterns have not been entirely neglected, especially in research specific to each

country, e.g. Amin *et al.* 2002, Sathar *et al.* 2008, and Dommaraju and Agadjanian 2009).

Specifically, the principal contributions of this research are as follows:

(i) The sources of fertility decline will be ascertained using a fertility model developed by Casterline (2010) that distinguishes nuptiality, demand for children, and rates of wanted and unwanted fertility. Note that this model places heavy emphasis on the distinction between wanted and unwanted fertility; this is a critical feature of this research.

(ii) The model is applied to sub-national units – divisions in Bangladesh (6), states in India (17 largest), and provinces in Pakistan (4). That is, for this analysis the populations of the three largest South Asia countries will be grouped into 27 units. However, the analysis and interpretation will recognize the existence, and importance, of the three nation-states, and we will be attentive to geographic clusterings of divisions/states/provinces.

This will be a largely demographic analysis. We view this as the first step towards a richer social scientific exploration of fertility decline in South Asia, relating the decline to historical legacies, to social and economic changes during the past four decades, and to public policy and programmatic initiatives. There are a few existing studies that attempt to explain cross-border spatial patterns of fertility behavior: Ramesh (2001) attributes the dissimilarity in fertility between the Pakistani and Indian Punjab to the quality and quantity of family planning services, and Amin *et al.* (2002) attribute some highly salient similarities in the fertility transitions in Bangladesh and West Bengal to shared language and culture. We will take some tentative steps towards explaining the sub-regional patterns, in particular similarities in contiguous areas (whether or not these cross national boundaries). But our first priority in this paper is to get a good grip on the joint demographic and spatial patterning of the South Asian fertility decline.

Models

This research relies heavily on the distinction between *wanted* and *unwanted* fertility, with the former closely related to the concept of the *demand for children*. We make no claim that this theoretical perspective has exclusive validity or that it is superior to others in the large and rich literature on fertility. Rather, we only assert that these distinctions are consistent with – indeed central to – most underlying behavioral models of fertility as well as prominent macro frameworks for fertility decline; we can point to the influential frameworks of Ansley Coale and Richard Easterlin, for example.

There are two forms of the model developed by Casterline (2010), with the second a simple elaboration of the first. Define

b^w wanted births
e^w woman-years of "want another birth"
$r^w = b^w / e^w$ wanted fertility rate, conditional on the risk of wanted birth

and the same can be defined for unwanted fertility (subscripted u). Further, define

p^w proportion of exposure "want another birth"
p^u proportion of exposure "do not want another birth"

Noting that ($p^u + p^w = 1$), we have the following expression for the age-specific fertility rate f

$$f = r^w * p^w + r^u * (1 - p^w) \quad (1)$$

With this model, a decomposition of fertility decline can be performed that attributes change to three sources:

- change in the demand for children (i.e. fertility preferences)
- change in wanted fertility rates
- change in unwanted fertility rates

The model can be elaborated to break out the contribution of changes in *nuptiality*. Define

r^n wanted fertility rate among the never married
p^n proportion never married among those who "want another child"

Then we have

$$f = r^u * p^u + r^n * p^n * (1 - p^u) + r^w * (1 - p^n) * (1 - p^u) \quad (2)$$

With this model, a decomposition of fertility decline can be performed that attributes change to four sources:

- change in the demand for children (i.e. fertility preferences)
- change in wanted fertility rates
- change in unwanted fertility rates
- change in union patterns (nuptiality)

Data and Methods

The analysis will use Demographic and Health Survey [DHS] data collected in each country. (These are "National Family Health Surveys" [NFHS] in India.) As it happens, all three countries conducted such national surveys in the period 1990-93 and 2005-07, i.e. roughly fifteen years apart:

Bangladesh:	1993-94;	2007
India:	1992-93;	2005-06
Pakistan:	1990-91;	2006-07

The historical coincidence of the surveys in the three countries is a convenience that adds cross-country consistency, but historical date *per se* is not crucial to this analysis: the national fertility declines are at

different stages during the period marked off by the pairs of surveys, and this will be even truer at the sub-national (division/state/province) level.

The survey data allow for the estimation of all of the elements of equations (1) and (2) above, as demonstrated in Casterline (2010). Note that unwanted fertility is estimated via the method developed by Casterline and el-Zeini (2007).

Analysis

The analysis will proceed in four stages.

In the first, the two decompositions described above – a three-element decomposition and a four-element decomposition (adding nuptiality) – will be performed for the 27 sub-national populations. These will be percentage decompositions (e.g. percentage of observed fertility decline attributed to changes in the demand for children, etc.). The distributions of these percentage decompositions will be examined and summarized, e.g. means/medians. National averages will also be computed.

In the second stage, we will analyze associations at the sub-regional level among the elements of the decompositions. For example, we will consider whether declines in wanted and unwanted fertility rates more often have offsetting or reinforcing effects, or whether contributions of declines in the demand for children and unwanted fertility are positively or negatively correlated across sub-regional units. This second stage will produce a rich and in-depth portrait of the character of recent fertility decline in South Asia.

The third and fourth stages will shift the research towards more social scientific and explanatory analysis. In the third stage, we will search for geographic patterning of the decomposition results across South Asia. In this exercise, we will be attentive to national boundaries but our basic perspective treats South Asia as 27 units. Questions of interest include whether there is a clear North-South gradient in the decomposition results, or an East-West gradient in the results across the northern part of the sub-continent. And we will search for other, possibly more complicated, geographic patterns.

Finally, in the fourth stage we will attach available indicators of social and economic factors – measured in level and in change -- to the decomposition results. Abundant data at the sub-national level are available in published form (including websites) for all three countries, and we will take advantage of this. There is also some sub-national data on public policies and on public investments in health and family planning, especially for the states of India; but there are measurement and interpretational issues about these data, and hence we must proceed cautiously and therefore may not incorporate them in this paper.

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Short Abstract

Recent trends in fertility and its proximate determinants in the three populous countries of South Asia – Bangladesh, India, and Pakistan – are well-established thanks to successive national demographic surveys in all three countries. This research augments the existing literature by: (i) Decomposing fertility change into contributions of changes in the demand for children, changes in wanted and unwanted fertility rates, and changes in nuptiality; this brings into focus distinctions that are central to major frameworks for fertility decline. (ii) Conducting the analysis at the sub-national level, i.e. 27 divisions/states/provinces; this recognizes the within-country heterogeneity in these large South Asian countries as well as cross-country shared legacies (Bengal, Punjab). We analyze national fertility survey data collected in 1990-93 and 2005-07 in all three countries. We consider patterns of two types: associations between elements of the decomposition (e.g. change in the demand for children and change in the unwanted fertility rate); geographic patterns.