**Waiting to Wed, Rushing to Birth: Who is Driving Trends in the Timing of Marriage and First Birth in Asia?**

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## Background

Marriage delay is a common feature of the Asian demographic landscape, though different regions of Asia experience variation in average ages at marriage and rates of increase in the age at marriage over recent decades (e.g. Jones 2009; 2007a). Two regionally-defined patterns distinguish South Asia, where marriage typically occurs during the mid-adolescent years for young women, from Southeast Asia, where women typically marry in their early 20's.

Delayed marriage is often promoted as an effective strategy to delay childbearing, particularly where non-marital childbearing is rare (WHO). Where marriage age is traditionally low, gender equality advocates herald marriage delay for its potential to improve girls' education, agency and life options. Public health experts welcome such trends for the potential to avert "too early" pregnancies and closely spaced pregnancies, and the negative maternal health problems associated with them.

Demographers have noted both implicitly and explicitly a link between marriage timing and the quantum and tempo of fertility. Where non-marital fertility is low and marriage universal, birth postponement promulgated by delayed marriage may contribute substantially to reduced fertility (Hirschman and Rindfuss 1980; Hirschman 1985; Timaeus and Moultrie 2008). Beyond cumulative fertility, marriage age is also implicated in the timing of onset of childbearing. Empirical evidence typically observes that increases in the age at childbirth are smaller than increases in age at marriage (Mensch, Bruce, & Greene 1998), i.e. that declining marital birth intervals accompany increasing age at marriage (Tsui 1982; Rindfuss & Morgan 1983; Dyson & Moore 1983; Trussel & Reinus 1989). In short, these are not independent trends.

The observed association between increasing marriage age and declining first birth intervals has been attributed alternately to biological factors as marriage moves from women's sub-fecund to peak fecund years (Amin & Bajracharya 2011; Kallan and Udry 1986); motivations for couples marrying at older ages to compensate for their "late start" (a form of "catch-up" fertility) (Basu 1993; Mensch et al 1998), or greater coital frequency in choice marriages or marriages to a familiar as opposed to arranged marriages (Feng and Quanhe 1996; Fricke and Teachman 1993; Rindfuss and Morgan 1983).

However commonly occurring, the simultaneous trends of increasing age at marriage and declining first marital birth interval do not produce a clear, direct, and consistent relationship. Although related, variation in the first birth interval across countries in Asia can be only loosely explained by marriage timing. Rather, there is great variation in the duration of the first birth interval given equivalent average age at marriage (Amin & Bajracharya 2011).

In the countries studied here, the distinct regional South Asian and Southeast Asian patterns that characterize marriage timing are not apparent with regards to the first birth. The variation in both the age at first childbirth and the duration of the first birth interval transect the regional divisions

exhibited in age at marriage: India and Indonesia experience a very similar mean age at first birth at around 21 years despite disparate mean ages at marriage; Changes in the duration of the first birth interval has been nearly flat in the Philippines, but not so in Vietnam.

While the available explanations support the general direction of the relationship between marriage timing and the duration of the first birth interval, they are inadequate in explaining the variation across populations in the relationship between them. It remains that the mechanisms by which marriage timing (whether expressed as the age at which marriage occurs or by the rate of change in age at marriage) affects timing of the first birth are not fully understood. To better gain purchase on the relationship between these trends, it may be advantageous to first examine ***who*** is marrying late and ***who*** is rushing into or postponing childbearing upon marriage.

This paper uses Demographic and Health Survey data from six Asian countries to elucidate the relationship between marriage timing and the first birth interval by investigating the socio-demographic composition of both trends. Specifically, the paper asks:

- Within each study country, are these trends universal? Alternately, is the move to later marriage or shorter first birth interval instead concentrated in selective segments of the population? That is, are these trends driven by certain population subgroups?
- To what extent are those subgroups that account for changes in marriage timing the same or different from those that account for changes in duration of the first marital birth interval?
- Do these population subgroups differ by country?
- Is the strength of the relationship between increasing age at marriage and a decreasing first marital birth interval the same across different population subgroups?

## Methods

This paper uses data from the Demographic and Health Surveys (DHS) for three countries in South Asia and three in Southeast Asia. These are: Bangladesh, India, Nepal, Indonesia, the Philippines, and Vietnam. The core analysis uses the most recent DHS available for each country (all later than 2005), supplemented by prior waves to confirm findings of trends over time.

Table 1. Analytic sample of women aged older than 30 years

| | Country | | | | | |
|---|---|---|---|---|---|---|
| Latest DHS (n=80,964) | Bangladesh | India | Nepal | Indonesia | Philippines | Vietnam |
| 2005 | | | | | | 7,293 |
| 2006 | | 56,970 | 4,544 | | | |
| 2007 | 5,539 | | | 2 1,655 | | |
| 2008 | | | | | 6,618 | |
| All DHS surveys (n=347,531) | 42,389 | 152,844 | 13,311 | 96,999 | 26,846 | 15,142 |

The analytic dataset is restricted to all ever-married women for which there are complete data on the variables of interest. Additionally, while the youngest birth cohorts in the surveys most immediately exhibit current trends in marriage and first birth timing, they are incomplete

marriage cohorts (left censored). To reduce the selection effects that would be present if early-marrying women were over-represented in the data, analysis of the first birth interval is restricted to women aged 30 and older. As marriage is universal in each of these countries, more than 90% of the sample is married by age 30, and 95% or more by age 40.

The paper will first use a series of graphical and other bivariate analyses to examine the association of age at marriage and the duration of the first marital birth interval with numerous socio-demographic characteristics: geographic region; urban/rural residence; religion, caste, or ethnicity; socio-economic status; and education. The DHS records variables for timing of marriage and first birth, using century month codes. Age at marriage and age at first (marital) birth, to the month, are computed from these. The length of the first marital birth interval is calculated as the difference between these and expressed in months. Premarital conceptions and births are dropped from the analysis.

An advantage of DHS analysis is the availability of a range of socio-demographic variables that are comparable across diverse settings. Most independent variables, like urban/rural residence, are defined in a common manner in each country. Socio-economic status is captured through an asset-wealth index commonly applied to DHS data on ownership of household assets and dwelling materials, with households ranked in quintiles (Filmer and Pritchett 2001). Educational attainment is categorized as "no schooling," "primary", "secondary" and "greater than secondary." Evidence from India indicates that geographic region of the country may be associated with distinct patterns of demographic behavior and marriage and kinship regimes that may be reflected in the study's dependent variables (Dyson and Moore 1983), so regional measures will be factors in the analysis. Measures capturing caste, ethnic, or religious groups are necessarily country-specific.

Following extensive bivariate analyses, separate multivariate models will be used to identify the socio-demographic and other determinants of later marriage and of shorter birth intervals. Interactions between independent variables may be included in these models. Because marriage is a selective process, the model for duration of the first birth interval will adopt a Heckman's selection model to control for this selection and more accurately estimate the independent contribution of marriage timing and of socio-demographic factors to shorter birth intervals. A final analysis will introduce age at marriage into the model for length of the first birth interval (thereby removing the need for a selection model). This model effectively tests the strength of the influence of marriage timing on the birth interval, controlling for socio-demographic factors that may mediate it. These models will be repeated for each country separately to determine if the relationship between marriage timing and the birth interval operates differently across these dissimilar settings.

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