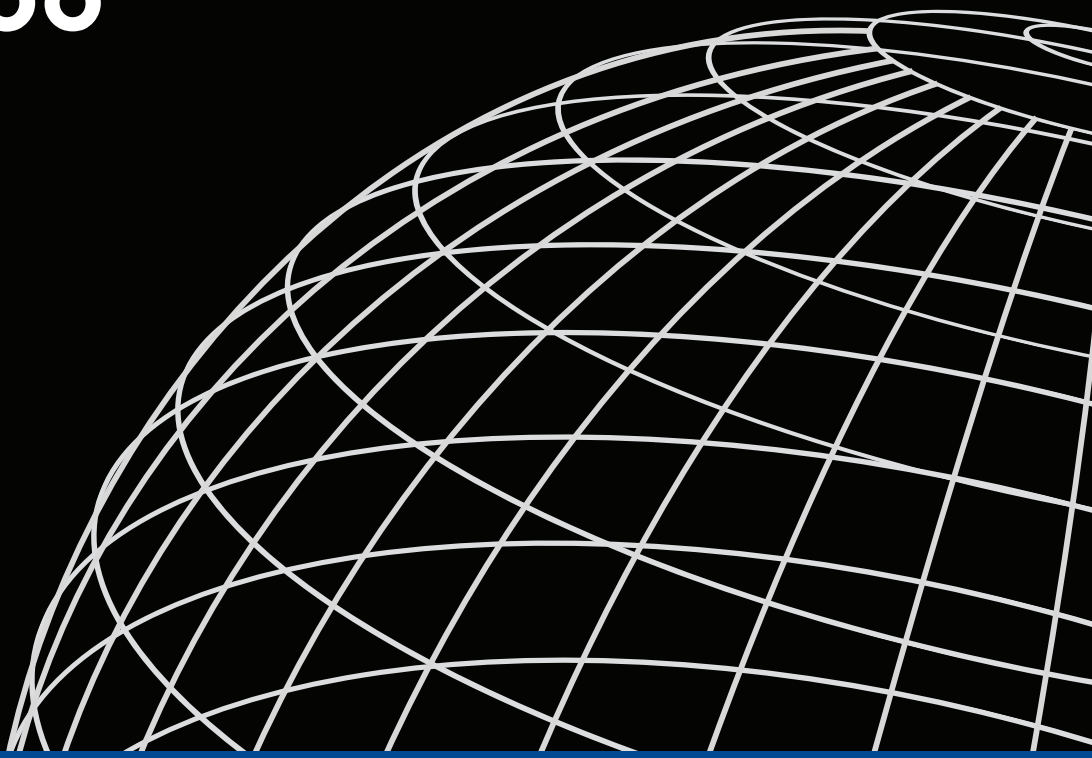
USAID
FROM THE AMERICAN PEOPLE

MARRIAGE AND FERTILITY DYNAMICS: THE INFLUENCE OF MARRIAGE AGE ON THE TIMING OF FIRST BIRTH AND BIRTH SPACING

DHS ANALYTICAL STUDIES 56



August 2016

This publication was produced for review by the United States Agency for International Development. It was prepared by Kerry L.D. MacQuarrie.

DHS Analytical Studies No. 56

Marriage and Fertility Dynamics: The Influence of Marriage Age on the Timing of First Birth and Birth Spacing

Kerry L.D. MacQuarrie[1]

ICF International

Rockville, Maryland, USA

August 2016

[1] The DHS Program, Avenir Health

Corresponding author: Kerry L.D. MacQuarrie, The DHS, ICF International, 530 Gaither Road, Suite 500, Rockville, MD 20850, USA; phone: +1 301-572-0282; fax: +1 301-407-6501; email: Kerry.macquarrie@icfi.com

Acknowledgments: The author extends her gratitude to numerous people who contributed to the production of this study in various capacities: Margaret Greene of GreeneWorks for her thoughtful review of an earlier draft; Stew Tolnay, Charlie Hirschman, Aimée Dechter, Sara Curran, and Darryl Holman of University of Washington for their feedback on the preliminary study idea; Tom Pullum, ICF International, for technical and programming guidance on managing birth histories data; Daniel Powers, University of Texas, for suggestions for the multivariate decomposition models; and Amy Finnegan, Duke University, for assistance organizing relevant literature.

Editor: Diane Stoy
Document Production: Natalie La Roche

This study was carried out with support provided by the United States Agency for International Development (USAID) through The DHS Program (#AID-OAA-C-13-00095). The views expressed are those of the authors and do not necessarily reflect the views of USAID or the United States Government.

The DHS Program assists countries worldwide in the collection and use of data to monitor and evaluate population, health, and nutrition programs. For additional information about The DHS Program, contact The DHS Program, ICF International, 530 Gaither Road, Suite 500, Rockville, MD 20850, USA; phone: 301-407-6500; fax: 301-407-6501; email: reports@dhsprogram.com; Internet: www.dhsprogram.com.

Recommended citation:

MacQuarrie, Kerry L.D. 2016. *Marriage and Fertility Dynamics: The Influence of Marriage Age on the Timing of First Birth and Birth Spacing*. DHS Analytical Studies No. 56. Rockville, Maryland, USA: ICF International.

Contents

Tables

Figures

Preface

The Demographic and Health Surveys (DHS) Program is one of the principal sources of international data on fertility, family planning, maternal and child health, nutrition, mortality, environmental health, HIV/AIDS, malaria, and provision of health services.

One of the objectives of The DHS Program is to analyze DHS data and provide findings that will be useful to policymakers and program managers in low- and middle-income countries. DHS Analytical Studies serve this objective by providing in-depth research on a wide range of topics, typically including several countries and applying multivariate statistical tools and models. These reports are also intended to illustrate research methods and applications of DHS data that may build the capacity of other researchers.

The topics in the DHS Analytical Studies series are selected by The DHS Program in consultation with the U.S. Agency for International Development.

It is hoped that the DHS Analytical Studies will be useful to researchers, policymakers, and survey specialists, particularly those engaged in work in low- and middle-income countries.

Sunita Kishor
Director, The DHS Program

Abstract

In a context of rising marriage age for women and a compression of first birth intervals, this study uses survival analysis, hazard models, and multivariate decomposition techniques to investigate the influence of marriage age on the first birth interval over time, and the implications of both marriage age and first birth interval on the second birth interval. Secondarily, the study assesses the influence of the gender context. The study analyzes these relationships in seven countries—four in South Asia and three in Southeast Asia—that have experienced significant change in either age at marriage or the first birth interval, or both. Demographic and Health Surveys data from over approximately a decade are used to examine changes in these dynamics over time. Significant increases in marriage age and significant decreases in the first birth interval (except in Cambodia) are observed, albeit at varying rates. Later marriage is associated with shorter first birth intervals but longer second birth intervals. Marriage age remains the most consistent influence on the first birth interval after controlling for birth cohort, gender context, and women's and husbands' characteristics. Compositional shifts toward later marriage contributes substantially (38%-89%) to declines in the first birth interval in Bangladesh, India, Nepal, Pakistan, Indonesia, and the Philippines, while a change in the effect of marrying later contributes to change in the first birth interval in India and Nepal. Marriage age continues to influence the second birth interval, after controlling for the length of the first birth interval and other covariates.

Executive Summary

Marriage age has steadily risen for women in much of South and Southeast Asia, although different regions experience variation in average ages at marriage and rates of increase. A relationship between nuptiality patterns and certain fertility dynamics, specifically the initiation of childbearing and total fertility, is well established and there is an expected shortening of the first birth interval that coincides with later marriage. However, there is variation across countries in the first birth interval and its rate of change—even when average marriage age is similar. Less known is whether marriage age or other factors exert more influence on the first birth interval, whether trends in marriage age and the first birth interval are universal or localized among selected subgroups of women, and to what extent compositional shifts contribute to changes in the first birth interval and the relative importance of marriage age to birth spacing beyond the first birth interval.

This study uses survival analysis, hazard models, and multivariate decomposition techniques to investigate the influence of marriage age on the first birth interval over time, and the implications of both marriage age and first birth interval for the second birth interval. In addition, attention is given to indicators that describe the gender context. The study addresses these relationships in seven countries—four in South Asia and three in Southeast Asia—which have experienced significant change in either age at marriage, the first birth interval, or both in recent decades. Data from Demographic and Health Surveys are used from two points in time over approximately a 10-year period to examine changes in these dynamics over time.

This study identified two distinct marriage patterns based on region: median completed age at marriage is low (during adolescent years) in South Asia and older in Southeast Asia. Similarly, the median completed age at first birth is lower—and the difference between median age at first birth and marriage is longer—in South Asia than in Southeast Asia.

However, time trends are not contrasted consistently between the two regions, nor are they consistent with region. Instead, the pace of change has been variable. Marriage age has increased rapidly in Indonesia, Nepal, and Bangladesh, but has been slower elsewhere. The difference between the median completed age at marriage and first birth has remained steady in Pakistan, Cambodia, and the Philippines, but narrowed elsewhere.

The mean marriage age has increased significantly in all study countries. With this increase, the first birth interval[1] has become significantly shorter in four countries: Bangladesh, Nepal, Pakistan, and Indonesia. The decrease has been smaller in Pakistan and Indonesia. Meanwhile, the first birth interval has lengthened significantly in India and the Philippines while there has been no change in Cambodia.

This study examines trends in marriage age across a range of indicators that describe the gender context, women's socio-economic and socio-cultural milieu, and husband's characteristics. The study found universal increases in mean marriage age in South Asia (and Indonesia), across nearly all categories or levels of these indicators. However, marriage age increased at differential rates among groups in these countries. Increases in marriage age are localized in Southeast Asia within groups where marriage age was already higher, which means that differentials in marriage age grew wider by most characteristics in most countries. Trends in Indonesia, both in marriage age overall and across subgroups of women, more closely resemble those observed in South Asia than in either Cambodia or the Philippines.

[1] As measured by the extended mean.

There is a significant change in the first birth interval over (roughly) the last decade in every study country with the exception of Cambodia. While mean marriage age increased significantly in all countries, the first birth interval became significantly shorter by 0.5-6.5 months in Bangladesh, Nepal, Pakistan, and Indonesia. On the other hand, the first birth interval increased significantly by 0.6 months in India and by 2.8 months in the Philippines.

In general, there has been more variation in trends in the first birth interval across gender context, and women's and husband's characteristics than in trends in marriage age. As with marriage age, change in the first birth interval is observed to be generally universal across subgroups of women in the South Asian countries in the study, according to women's decision-making, spousal age difference, household wealth quintile, subnational region, and the husband's education and occupation. Contrasted with changes in marriage age, change in the first birth interval is more often concentrated in specific groups of women according to attitudes toward wife beating, women's education and occupation, religion, and place of residence. Change in the first birth interval is almost always localized in just a few select subgroups of women in Southeast Asia for all of the characteristics examined in the study. Indonesia again resembles the South Asian countries with regard to trends in the first birth interval according to residence and region. Disparities in the first birth interval by spousal age difference, wealth, place of residence, and husband's education narrowed over time in most study countries, but increased or remained steady for other indicators.

Nearly all characteristics examined in this study are associated with marriage age in bivariate analyses in all study countries. The patterns of association are observed in South and Southeast Asian countries alike, with the degree of difference in marriage age across a characteristic varying across countries rather than regions. Indicators that describe a more gender equitable context (more women's decision-making, attitudes that reject wife beating, small spousal age difference) are associated with an older marriage age, with women's decision-making appearing to be the least important among the three variables. Women's education, employment in professional or clerical occupations, household wealth, and urban residence are positively associated with older marriage age in all study countries. Husband's education and, to a lesser extent, husband's occupation in professional positions are also associated with marrying later. Women who are not working or are employed in agricultural occupations marry at younger ages, as do women married to husbands in agricultural occupations. Marriage age varies by subnational region and religion, but patterns are inconsistent across countries. This inconsistency points to the significance of local context rather than broad regional patterns.

There is greater homogeneity in marriage age in Cambodia than in other study countries. Differences in marriage age across characteristics are usually small and sometimes non-significant (e.g. women's decision-making, women's occupation, and religion) in Cambodia, whereas they are generally large in India and Indonesia (as is the case with regard to education, wealth, place of residence, and husband's characteristics). Compared with marriage age, there are somewhat fewer associations between first birth intervals and the characteristics examined in this study.

This study finds a strong, consistent, and negative association between marriage age and the hazard of the first birth interval in bivariate and multivariate analysis in six of the seven study countries, with the Philippines the exception. However, the magnitude is modest. First birth intervals are 2-6% shorter with each year increase in age at marriage. This relationship is robust with the inclusion of controls, but declines to 1-2% shorter intervals with each year increase in age at marriage. A significant positive association between marriage age and the first birth interval, initially not apparent in bivariate analysis, emerges in the Philippines when controlling for other factors. Marriage age influences the first birth interval independent of the effect of birth cohort.

Birth cohort also independently influences the first birth interval. Birth cohort has a negative association, meaning that the first birth interval declines over time even after controlling for increases in marriage age. This birth cohort effect reinforces the influence of marriage age on first birth intervals over time.

There is substantial variation across countries in other characteristics associated with the first birth interval in multivariate hazard models. Two indicators that describe the gender context—spousal age difference and women's decision-making—are generally associated with the first birth interval in most South Asian countries, while attitudes toward wife beating are not. Women's decision-making is negatively related to the first birth interval, although not monotonically; there is a small increase with a longer first birth interval among women with the greatest decision-making capacity in some countries. This association loses significance in Cambodia and is significantly positive in Pakistan when controlling for marriage age and other factors. There is no association in Southeast Asia. Spousal age difference is curvilinearly associated with the first birth interval, so that the intervals are longest among those with very little and very large age differences. Independent of controls, spousal age difference is negatively associated with the first birth interval only in Bangladesh and India and positively so in the Philippines.

Women's education is associated with shorter first birth intervals in bivariate analysis; this association is retained in Pakistan and the Philippines with multivariate controls. However, education has a positive association with the first birth interval even after accounting for marriage age and other controls.

Rural residence is associated with longer first birth intervals in India, Nepal, and Pakistan, whereas urban residence is associated with longer first birth intervals in Bangladesh and Indonesia, even after age at marriage and other controls. There is no association in Cambodia or the Philippines, which suggests that urban residence is more salient in South Asia than Southeast Asia. The first birth interval varies by subnational region in three of five countries (India, Nepal, and the Philippines) after controlling for other factors, with the greatest regional differences in India and smaller in Nepal. There is no such association in Bangladesh or Pakistan.

Bivariate analysis suggests that women who are not working or are employed in agricultural occupations or unskilled manual labor have shorter first birth intervals while those employed in professional and clerical occupations have longer first birth intervals. These associations are rarely observed when controlling for marriage age and other covariates. Associations with wealth and religion are similarly sporadic in multivariate analysis. Attitudes toward wife beating and husband's characteristics (education and occupation) are infrequently associated with the first birth interval.

Decomposition analysis investigates whether first birth intervals changed as they did over time because women marry at later ages, other characteristics changed (composition component), or whether the first birth interval changed because the rate these women are subject to has changed (effects component). The study finds no regional pattern in changes in composition, changes in rates, or both that drive the change in the first birth interval. Changes in the composition component contribute the majority of change in the first birth interval in Nepal and Pakistan in South Asia and Indonesia in Southeast Asia, whereas changes in the effects component contribute more to the overall change in Bangladesh and India in South Asia and the Philippines in Southeast Asia.

Both India and the Philippines experience significant change in the composition and effects components, in opposing directions. Changes in composition would imply shorter first birth intervals and changes in rates (effects) would imply longer first birth intervals (if all else had remained the same); the net effect of these changes is a longer first birth interval over time.

The lack of significant change in first birth intervals in Cambodia could have been the net result of compositional and rate changes of equal magnitude operating in opposing directions. It is not. Cambodia

has not experienced a significant change in either the overall composition or effects component or in either the composition or the effect of marriage age or any other constituent factors.

In detailed decomposition results, marriage age is a significant influence on declines in first birth intervals in the six countries that have experienced change in the first birth interval. More women marrying later than they did in the past accounts for 38-89% of the change in the first birth interval in the four South Asian countries and -10% of the change in Philippines and 86% of the change in Indonesia. The rate (effect) of marriage age has changed over time in India and Nepal, which implies shorter first birth intervals at each age of marriage in India and longer first birth intervals at each age of marriage in Nepal. With these two exceptions, the effect of marriage age on the first birth interval has not changed over time.

By and large, neither changes in the composition nor effect of the gender context variables contribute to change in the first birth interval. Changes (reductions) in the spousal age difference contribute modestly to longer first birth intervals in South Asia, but not in Southeast Asia.

The two countries where the first birth interval increased rather than decreased over time (the Philippines and India) manifest slightly different driving factors. In India, the contributions to a shorter first birth interval of more women marrying at older ages are amplified by a shorter first birth interval at all ages of marriage. However, the effect of these shifts in both composition and rate is reversed by cumulative changes in rates. Women in selected occupations, with secondary and higher education, and Hindu women, among others, experience longer first birth intervals and this combination of attributes results in slightly longer first birth intervals overall.

In the Philippines, contributions to shorter first birth intervals of more women marrying at older ages than in the past are reversed by cumulative changes in rates over time for certain subgroups. Most notably, the first birth interval has become longer among Roman Catholics (contributing 345% to the change in the first birth interval), women with any education, women in the National Capital and two other regions, women who do not work, and those with husbands in professional occupations.

As with the first birth interval, marriage age is strongly and significantly associated with the second birth interval, although the size of the effect is modest. Marriage age is associated with a 1.3-3.5% longer second birth interval in all seven countries. The effect is attenuated slightly with controls except in Pakistan, where the association is no longer significant. The result leads to the conclusion that marriage age influences not just the timing of the first birth, but also subsequent birth spacing, even after controlling for changes in birth cohort, the duration of the first birth interval, and other covariates.

The duration of the first birth interval is positively associated with second birth interval, except in Nepal. This influence is particularly strong for women with first birth intervals in the longest tercile. These women experience second birth intervals that are 5-20% longer than women whose first birth intervals fall in the shortest tercile. Similarly, women who were born in later birth cohorts experience longer second birth intervals than do women born between 1960-69 in all countries except India and Pakistan.

In contrast, indicators that describe the gender context are poorly and inconsistently associated with longer second birth intervals, after controlling for marriage age, birth cohort, first birth interval, and other covariates. This finding would suggest that, to the extent that gender context influences birth spacing, it does so largely indirectly through these other factors. Husband's characteristics and women's place of residence are also inconsistently associated with the second birth interval. However, several socio-economic and socio-cultural indicators (education, wealth, and more occasionally subnational region and religion) tend to be independently associated with the second birth interval, net of other factors.

1. Background

The previous several decades have seen a general, steady rise in the age at marriage for women around the world (Lloyd 2005). Marriage delay is a common feature of the Asian demographic landscape, although different regions of Asia experience variation in average ages at marriage and rates of increase (e.g. Jones 2007, 2009). Marriage continues to be near universal with more than 95% of women marrying by age 40 in each of the South and Southeast Asian countries, while rates of singlehood have increased appreciably in some East Asian countries (Jones 2009; Lloyd 2005; Retherford, Ogawa, and Matsukura 2001).

Marriage and the initiation of childbearing are two significant milestones that mark a transition from childhood or adolescence to adulthood. Early marriage (usually understood as marriage before the age of 18 or during adolescence) is viewed as a violation of human rights (Nguyen and Wodon 2012b; Nour 2009; UNICEF 2005). It is also associated with a range of adverse social outcomes (Singh 1998), including lower educational attainment (Field and Ambrus 2008; Kim and Stinner 1980; Lloyd and Mensch 1999; Lloyd and Mensch 2008; Nguyen and Wodon 2012a; Nguyen, Wodon, and Wodon 2015; Tian 2013; Vogelstein 2013; Wodon, Nguyen, and Tsimpo 2016), greater poverty and economic insecurity (UNICEF 2005), disempowerment of women (Klugman et al. 2014; MacQuarrie 2009; Malhotra et al. 2011; Wodon, Nguyen, and Tsimpo 2016), and gender-based violence (Raj 2010; Speizer and Pearson 2011; UNICEF 2005). In countries where marriage age is traditionally low, gender equality advocates herald marriage delay for its potential to improve girls' education, agency, and life options.

Marriage at young ages is also associated with "too early" pregnancy and poor reproductive health outcomes (Bongaarts and Cohen 1998; Godha, Hotchkiss, and Gage 2013; Santhya et al. 2010). This includes greater risk of maternal mortality and morbidity (Loaiza Sr. and Wong 2012; Murphy and Carr 2009) as well as infant mortality (Amin and Bajracharya 2011a; Wachs 2008), low birth weight and child stunting outcomes (Lloyd and Mensch 2008; Raj et al. 2010). The World Health Organization has estimated that births to adolescents contribute disproportionately to pregnancy and birth-related burden of disease (Chandra-Mouli, Camacho, and Michaud 2013).

Delayed marriage is often promoted as an effective strategy to delay childbearing, particularly where non-marital childbearing is rare (Chandra-Mouli, Camacho, and Michaud 2013; Hindin et al. 2016). Public health experts welcome such trends for the potential to avert "too early" pregnancies and closely spaced pregnancies, and the associated negative maternal health problems. These concerns form the impetus for policy and programmatic actions to delay marriage among girls, which have burgeoned in recent years (Chandra-Mouli, Lane, and Wong 2015; Kalamar, Lee-Rife, and Hindin 2016; Lee-Rife et al. 2012).

That prevailing nuptiality patterns and fertility are closely associated is well acknowledged in demographic literature, as evidenced by the inclusion of marriage age as one of four proximate determinants of fertility (Bongaarts 1978, 2015). Demographers have noted both implicitly and explicitly that there is a link between marriage timing and the quantum and tempo of fertility (Donaldson and Nichols 1978). In populations with higher age at marriage, total fertility is generally observed to be low (Abedin 2011; Ertem et al. 2008). This reduction in total fertility with increasing marriage age can occur if non-marital fertility is negligible and age-specific marital fertility rates are not substantially different from marriage age. Where non-marital fertility is low and marriage universal, birth postponement promulgated by delayed marriage may contribute substantially to reduced fertility (Bongaarts 1999; Hirschman 1985; Hirschman and Rindfuss 1980; Timaeus and Moultrie 2008). When marriage age increases, fertility declines because fewer women are at risk of childbearing and they have shorter spans of their reproductive careers. Later marriage in such settings delays entry into childbearing. Furthermore,

the length of the first birth interval frequently affects the pace of subsequent birth intervals (Rodriguez and Trussell 1980; Tsui 1982). In addition, shifts toward later marriage can result in lower fertility in settings where later marriage results in higher levels of "voluntary control of marital fertility" through contraception and/or abortion (Coale 1992). Thus, increases in age at marriage result in a compression of reproductive life span and influence both the tempo and the quantum of total fertility (Padmadas, Hutter, and Willekens 2004).

With the initiation of childbearing, empirical evidence typically observes that increases in the age at childbirth are smaller than increases in age at marriage (Bloom and Reddy 1986; Lloyd 2005; Mason and Entwisle 1985; Mensch, Bruce, and Greene 1998). That is, declining marital birth intervals accompany increasing age at marriage (Christensen 1939; Christensen and Bowden 1952; Dyson and Moore 1983; Feng and Quanhe 1996; Hirschman and Rindfuss 1982; Rindfuss and Morgan 1983; Trussell and Reinis 1989; Tsui 1982). Trussel and colleagues suggest that the first birth interval changes curviliearly with marriage age (Trussell, Menken, and Coale 1979). However, trends toward longer first birth intervals over time have also been observed (Christensen 1939; Christensen and Bowden 1952). This pattern has two implications. First, advocates who seek to move early pregnancies from the teen years and early 20's are likely to see smaller increases in age at first birth for each unit increase in age at marriage than desired. Second, increasing age at marriage and changes in the timing of the first birth are not independent trends. Trends in the first birth interval are likely to be associated with trends in marriage age. Furthermore, each of these trends may be influenced by a common set of social forces that act on both marriage timing and the initiation of childbearing.

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 period in the early adolescent years to peak fecund years in the 20's (Amin and Bajracharya 2011b; Kallan and Udry 1986; Trussell and Reinis 1989); motivations for couples marrying at older ages to compensate for their "late start" (a form of "catch-up" fertility) (Basu 1993; Mensch, Bruce, and Greene 1998), or greater coital frequency in choice marriages or marriages to a familiar partner as opposed to arranged marriages that may coincide with a later age at marriage (Feng and Quanhe 1996; Fricke and Teachman 1993; Rindfuss and Morgan 1983).

Empirical evidence largely bears out the expectation of a shorter first birth interval with increasing marriage age. While the available explanations support the general direction of the relationship between marriage timing and the first birth interval, they are inadequate in explaining the variation across populations. Although commonly co-occurring, the simultaneous trends of increasing age at marriage and declining first marital birth interval do not produce a clear and consistent relationship. For example, biological explanations of fecundity would lead us to expect shorter birth intervals at higher ages of marriage, and to expect birth intervals of similar duration among settings with similarly higher marriage ages. Instead, there is great variation in the duration of the first birth interval given an equivalent average age at marriage (Amin and Bajracharya 2011b). While all countries in which the median age at marriage was below 17 years, the first birth interval was consistently longer than 24 months. However, the birth interval in countries with higher median ages at marriage varies considerably.

This variation indicates that there remains much we do not know about the trends in and relationship between marriage timing and timing of the first birth. Little research has focused on this topic since the mid-80s. More recent research has examined biological factors or trends in marriage age or first birth independently of one another. The sociological mechanisms that underlie this pattern remain under-explored.

The few sociological explanations suggest that trends toward later age at marriage may be accompanied by other changes—erosion of arranged marriage (Feng and Quanhe 1996; Ghimire 2016; Ghimire and

Axinn 2013; Rindfuss and Morgan 1983), changes in spousal familiarity and coital frequency (Basu 1993; Fricke and Teachman 1993; Lavely 2007; Rindfuss and Morgan 1983), changing expectations about women's education and employment (Field and Ambrus 2008; Hirschman 1985; Hirschman and Rindfuss 1980; Kim and Stinner 1980), and shifts toward greater women's empowerment and a more equitable gender context (Desai and Andrist 2010; Dyson and Moore 1983; Malhotra and Tsui 1996; Mensch, Singh, and Casterline 2005; Shrestha 1998). These may also contribute to changes in the first birth interval directly or indirectly through their interaction with marriage age. For example, women who marry at older ages are more likely to participate in the selection of their marriage partner and have greater decision-making capacity upon marriage (Banerji and Vanneman 2011; Hong 2006; Jensen and Thornton 2003; Singh and Becker 2012). Such factors may influence the first birth interval directly through differences in coital frequency or the ability to enact decisions to control fertility. Whether an increase in marriage age is the only change or whether it is accompanied by other significant social changes and for whom may determine the degree of the marriage age's influence on the first birth interval. We also do not know how robust the effect of marriage age is on subsequent birth spacing beyond the first birth.

Underexplored questions include (1) for whom marriages occur later and births earlier; that is, are these changes experienced universally by all women or are they concentrated among select social groups? It has been documented that marriage age varies across socio-economic and socio-cultural factors with, for example, women from wealthier families marrying at younger ages and those with more education marrying at older ages (Aryal 2007; Jensen and Thornton 2003; Kim and Stinner 1980). Work by Coale and colleagues suggests that the age pattern of marriage follows a predictable normal distribution in settings where the age of marriageability is low, although as the mean marriage age rises, so does the degree of heterogeneity (Coale 1971; Coale and McNeil 1972). It is possible that the increasing heterogeneity in the distribution of marriage ages could account for some of the observed variation in first birth intervals at older mean marriage ages (Amin and Bajracharya 2011), particularly if increases in marriage age are unevenly distributed, for example, across educational or wealth subgroups.

Other questions that are underexplored are (2) whether births are occurring earlier for all who marry later, i.e., if the rate of the first birth interval is evenly distributed; (3) whether compositional shifts in marriage age or other social changes explain changes in the first birth interval and subsequent birth spacing; (4) the relative importance of marriage age when compared to these other factors in explaining the timing of the first birth; and (5) the relative importance of marriage age in explaining the first birth interval and subsequent birth spacing across country contexts.

This study examines the relationship between marriage age and two aspects of the family formation process: the initiation of childbearing (timing of the first birth) and subsequent birth spacing (the transition from the first to the second birth). To do so, the study uses Demographic and Health Surveys (DHS) data from seven countries in Asia: Bangladesh, India, Nepal, and Pakistan in South Asia and Cambodia, Indonesia, and the Philippines in Southeast Asia. Each of these countries has experienced a statistically significant change in the age at marriage or at first birth or both, while maintaining a norm of universal marriage. This study examines trends in marriage age and the first birth interval over time, along with shifts in the association of gender, women's, and husband's characteristics with marriage age and first birth interval. The study assesses the influence of age at marriage on the first birth interval through a multivariate hazard model and subsequently, decomposes the change in the first birth interval over time into shifts in composition (marriage age and other factors) and changes in effects (marriage age and other factors) upon the first birth interval. Finally, the study estimates a second hazard model to determine the independent influence of marriage age and the first birth interval on the second birth interval.

2. Methods and Data

2.1. Country and Survey Selection

This study uses data from seven countries in Asia: Bangladesh, India[2], Nepal, and Pakistan in South Asia and Cambodia, Indonesia, and the Philippines in Southeast Asia. Countries are included in the study if (1) marriage is or approaches being universal (≥95% women married by age 40); (2) the majority of childbearing occurs within marriage; (3) there has been a statistically significant change in either the age at marriage or at first birth or both; (4) there are two or more standard DHS surveys available over a span of more than 5 years; and (5) these surveys include the variables of interest.

DHS surveys are nationally representative, population-based household surveys that produce a broad range of demographic and health indicators. The surveys are generally large and enjoy response rates in excess of 90%. Standard DHS surveys routinely collect data on women's birth histories and on the timing of marriage; this makes these data well suited to the analysis of a variety of marriage and fertility dynamics. The surveys also collect data on a broad range of individual background characteristics and gender and women's empowerment relevant to the analysis of such dynamics. The surveys employ standardized questionnaires and modules for household, women's, and men's interviews (ICF International 2015). As such, they produce indicators that are comparable across countries and within countries over time.

Since The DHS Program began in 1984, it has conducted more than 300 surveys in 90 countries. Standard DHS surveys are implemented at intervals of about 5 years to allow for comparisons over time. Thirty-three surveys have been conducted in the countries selected for this study. This study uses the individual woman's survey, which is conducted among women of reproductive age (15-49). It uses each survey conducted in study countries to describe overall trends in the timing of marriage and first birth. However, the majority of the analysis uses either the most recent survey or the most recent survey paired with a survey that was conducted approximately 10 years prior ("priority surveys"). Sample parameters, including sample sizes and response rates, for the study's surveys can be found in Table 1. Priority surveys are indicated in bold.

[2] India DHS surveys are also referred to as the National Family and Health Surveys (NFHS).

Table 1. Sample parameters for surveys included in the analysis

Region and Country	Year of survey	Sample type	Age range	# of women interviewed (unweighted)	Eligible woman response rate
South Asia					
Bangladesh	**2014**	**Ever married women**	**15-49**	**17,863**	**97.9**
	2011	Ever married women	12-49	17,842	97.9
	2007	Ever married women	15-49	10,996	98.4
	2004	**Ever married women**	**10-49**	**11,440**	**98.6**
	1999-2000	Ever married women	10-49	10,544	96.9
	1996-97	Ever married women	10-49	9,127	97.8
	1993-94	Ever married women	10-49	9,640	97.4
India	**2005-06**	**All women**	**15-49**	**124,385**	**94.5**
	1998-99	**Ever married women**	**15-49**	**90,303**	**95.5**
	1992-93	Ever married women	13-49	89,777	96.1
Nepal	**2011**	**All women**	**15-49**	**12,674**	**98.1**
	2006	All women	15-49	10,793	98.4
	2001	**Ever married women**	**15-49**	**8,726**	**98.2**
	1996	Ever married women	15-49	8,429	98.2
Pakistan	**2012-13**	**Ever married women**	**15-49**	**13,558**	**93.1**
	2006-07	**Ever married women**	**15-49**	**10,023**	**94.5**
	1990-91	Ever married women	15-49	6,611	96.3
Southeast Asia					
Cambodia	**2014**	**All women**	**15-49**	**17,578**	**97.6**
	2010	All women	15-49	18,764	97.5
	2005	**All women**	**15-49**	**16,823**	**97.5**
	2000	All women	15-49	15,341	98.7
Indonesia	**2012**	**All women**	**15-49**	**45,067**	**95.9**
	2007	Ever married women	15-49	32,895	96.1
	2002-03	**Ever married women**	**15-49**	**29,483**	**98.3**
	1997	Ever married women	15-49	28,810	98.3
	1994	Ever married women	15-49	28,168	97.8
	1991	Ever married women	15-49	22,909	97.6
	1987	Ever married women	15-49	11,884	98.5
Philippines	**2013**	**All women**	**15-49**	**16,155**	**98.3**
	2008	All women	15-49	13,594	98.3
	2003	**All women**	**15-49**	**13,633**	**97.8**
	1998	All women	15-49	13,983	97.2
	1993	All women	15-49	15,029	98.0

Note: Analysis is restricted to ever-married women age 25-49.

2.2. Sampling and Sample Weighting

The surveys employ multistage, clustered area sampling techniques. In the first sampling stage, the country is stratified into major subnational regions from which census-based enumeration areas are selected with probability proportional to size. The major regions may or may not coincide with administrative units (as in the Philippines) and consist of states (India), provinces or groups of provinces (Cambodia, Indonesia, Pakistan), divisions (Bangladesh), or ecological zones (Nepal). Urban areas and less populous areas are typically oversampled in the first sampling stage to produce reliable regional estimates and rural-urban comparisons of health indicators. A mapping and household listing exercise is then conducted in each selected enumeration area. In the second sampling stage, households are randomly selected from the household list within each enumeration area.

Pre-calculated sampling weights are applied; these account for both sampling probability and non-response. In addition, the study uses the complex survey (svy) commands available within Stata 14.1 to account for the clustered sampling design and to estimate robust standard errors as the basis for 95% confidence intervals reported in the following sections.

2.3. Sample Restriction

This study's analysis is restricted to ever-married women age 25-49. This age restriction is imposed because the median age at marriage and first birth have not been reached by the start of the preceding age group, age 20-24, in all study countries; the median ages at these events have been reached by the start of the 25+ age groups. This restriction reduces the selection bias that would be present if early-marrying women were over-represented in the data.

Table 2 shows the attrition in sample size from excluding never-married women. As indicated, the proportion of women who are never-married at the most recent survey is sizable in Cambodia and the Philippines. Elsewhere, it does not exceed 5% of all women age 25-49.

While experiencing a birth is not a precondition for inclusion in the analytical sample, the analysis is restricted to women who marry prior to their first birth. That is, women who experience a negative first birth interval because their first birth occurred prior to marriage are excluded from all analyses. This demographically convenient life order sequence facilitates a valid and meaningful measure of the interval between marriage and first birth. The proportion of women experiencing a negative birth interval is small—less than 3%—in all study countries with the exception of the Philippines (7%), also as seen in Table 2. Analysis of the second birth interval is necessarily limited to women who have already experienced a first birth.

Table 2. Proportion of women age 25-49 excluded from analysis due to never being married or experiencing a negative first birth interval

	Never married		Negative first birth interval	
	%	# (unweighted)	%	# (unweighted)
South Asia				
Bangladesh 2014	0.00	0	1.24	165
India 2005-06	2.44	3,623	1.68	1,307
Nepal 2011	3.06	232	1.50	113
Pakistan 2012-13	0.00	0	1.58	166
Southeast Asia				
Cambodia 2014	7.99	974	2.34	276
Indonesia 2012	4.66	1,850	2.62	1,006
Philippines 2013	11.98	1,118	7.01	615

2.4. Measures

Century month codes

In DHS datasets, the dates of several key events are recorded in century month codes (Rutstein and Rojas 2006). A century month code (CMC) is the number of months elapsed between an event and January 1900. For example, the CMC corresponding to June 2012 is 1350. Century month codes are used to

record and calculate intervals between the respondent's date of birth, date of first union, date of birth for each of the respondent's children, and date of interview. The DHS invests significant effort to ensure that dates of these events are accurately reported through multiple data checks and procedures for reconciling discrepant reports and imputing missing information.

Age at marriage

Age at marriage refers to women's *first* marriage. This is calculated as the difference between the CMC of the respondent's date of first union and date of birth. This difference, expressed in months, is then divided by 12. Date of first union refers to the time that the respondent first began living with her husband. Cohabitation is a better measure of the initiation of marital sexual exposure—and thus of the starting point for the period of risk for the first birth interval—than date of formal marriage in settings where ceremonial marriages, spousal separation prior to menarche, or return marriage characterize the marriage process (Basu 1993; Bhattacharya et al. 1989; Choe, Thapa, and Mishra 2005; Rodriguez and Trussell 1980). Unions include both formal, legally recognized marriages as well as non-formal unions in which women are living together with a man as if married.

First birth interval

The first birth interval is the interval between marriage and the first birth. The length of the first birth interval is calculated as the difference between the century month codes for date of first union and date of first birth as expressed in months. Negative birth intervals (premarital births) are excluded from the analysis. First birth intervals of less than 8 months, which may possibly indicate premarital conceptions followed by a marriage and then birth, are retained in the analysis.

Second birth interval

Subsequent birth spacing is assessed through analysis of the second birth interval, which is the span of time between the first and the second births. The second birth interval is calculated as the difference between the century month codes for the second birth and the first birth, and is expressed in months.

Birth cohort

The measure that indicates the decade in which women were born is calculated based on the century month code for their date of birth. In this calculation, 1960-69 serves as the reference category in multivariate analysis. Only the India dataset includes respondents in the 1950-59 birth cohort. All others include women born in the 1970s and 1980s, in addition to the referent period.

Women's decision-making

Women's decision-making is one of three variables used to describe the gender context. The indicator is calculated as a simple (unweighted) additive index of the sum of the number of household decisions in which women participate. Component items are participation in decisions about:

1. *Healthcare for herself*
2. *Major household purchases*
3. *Visits to her family or relatives*

This index ranges from 0 to 3 in six of the seven study countries. In the Philippines, it ranges from 0-4 with an additional item about participation in decisions about purchases for daily household needs. Data on women's decision-making are included in the most recent survey for all countries in this study. However, these data were omitted from some earlier surveys in India and Pakistan. Therefore, this measure is excluded from analyses of change over time in these countries.

Attitudes toward wife beating

Women's attitudes toward wife beating, the second measure that describes the gender context, are assessed by responses to question that ask if respondents think a husband is justified in hitting or beating his wife in the following situations:

1. *If she goes out without telling him*
2. *If she neglects the children*
3. *If she argues with him*
4. *If she refuses to have sex with him*
5. *If she burns the food*

A dichotomous measure is calculated and set to 0 if the respondent reports wife beating to be acceptable in at least one of these scenarios and 1 if she rejects wife beating in all of these scenarios.

In the Nepal 2011 DHS survey but not the 2001 survey, a filter question was inserted. Respondents answering "no" when asked, "In your opinion, should a husband hit or beat his wife for any reason at all?" were not asked if wife beating was justified in specific scenarios. This questionnaire change may result in a measurement change (decrease) in the prevalence of attitudes accepting of wife beating as well as in detecting any associations with this variable.

Data on women's attitudes toward wife beating were not collected in Bangladesh DHS surveys. In addition, these data were omitted from some earlier surveys in India and Pakistan. Therefore, this measure is excluded from the analyses of change over time in these countries. Data on women's attitudes toward wife beating were collected consistently in the three Southeast Asian countries in this study.

Spousal age difference

Spousal age difference is the third variable that describes the gender context. This measure is calculated as the difference, in whole years, between women's completed age and that of her husband. In situations where women are the same age as or are older than their husbands, this indicator is set to 0. Therefore, this measure can be interpreted as the number of years by which husbands' age exceeds the woman's age.

Women's education

Women's education at the time of the survey is categorized into no education, primary, secondary, and higher education. No education is the reference category.

Women's occupation

Women's occupation is an indicator that captures whether women worked in the 12 months preceding the interview and, if so, in what occupation. Not working serves as the reference category. Occupational categories are:

1. *Agricultural*
2. *Professional/technical/managerial (hereafter referred to as "professional")*
3. *Clerical*
4. *Sales*
5. *Services*

6. *Skilled manual labor*
7. *Unskilled manual labor*
8. *Other*

No data on women's occupation is available in the Bangladesh DHS. In India, there is no differentiation between skilled and unskilled manual labor. In Nepal, there is no separate category for women working in sales. These respondents are grouped with those working in "other" occupations.

Household wealth quintile

This study uses household wealth quintile as a measure of relative wealth. This measure is calculated based on ownership of a range of assets and housing materials. The construction of this measure, now standard in DHS surveys, is described in detail elsewhere (Rutstein 2008; Rutstein and Johnson 2004). The poorest wealth quintile serves as the reference category.

Religion

Women's religious affiliation is a variable with country-specific response options. As a result, the reference religion is country-specific. The reference group is the largest religious group in each country. The reference religious group and other religious categories for each country are listed in Appendix Table 4. Muslim, Christian, Hindu, and Buddhist are common religious classifications found in the study countries. No data on religious affiliation is available in the Pakistan or Indonesia DHS surveys.

Place of residence

Place of residence captures whether the respondent resides in a rural or an urban area at the time of the survey, based on a priori classification of primary sampling units selected for the survey. Rural is the reference category.

Subnational region

Subnational region is the second country-specific indicator in the analyses. Subnational regions in this variable are those used in the first sampling stratum, along with urban/rural place of residence. These are divisions in Bangladesh; states in India (26); provinces or small groupings of provinces in Cambodia (19), Indonesia (6), and Pakistan (4); ecological zones in Nepal (3); and administrative regions in the Philippines (17). Although Bangladesh currently has 7 divisions, Rangpur and Rajshahi divisions were sampled as a single region in 2004 and not separately. Therefore, these two divisions were combined to ensure compatibility in the analyses of change over time.

Several pairs of states from the India 2005-06 dataset—Bihar and Jharkhand, Madhya Pradesh and Chattisgarh, Uttar Pradesh and Uttaranchal—were combined to be comparable to sampled states in the 1998-99 dataset. Similar changes and exclusions were made in Indonesia to account for territorial changes. In every country, the most populous region serves as the reference group. These are Dhaka, Bangladesh; Uttar Pradesh (including Uttaranchal), India; the Terai, Nepal; Punjab, Pakistan; Phnom Penh, Cambodia; Sumatera, Indonesia; and the National Capital administrative region, the Philippines. A full listing of the regions by country is found in Appendix Table 2.

Husband's education

Husband's education is taken from women's reports of their husband's level of educational attainment. This measure is also categorized as no education, primary, secondary, and higher education. There is a fifth category that does not exist for women's education: don't know. No education is the reference category.

Husband's occupation

Husband's occupation, also taken from women's reports, is categorized in the same manner as women's occupation:

1. *Agricultural*
2. *Professional/technical/managerial (hereafter referred to as "professional")*
3. *Clerical*
4. *Sales*
5. *Services*
6. *Skilled manual labor*
7. *Unskilled manual labor*
8. *Other*
9. *Not working*

Whereas "not working" is the reference category for women's occupation, agricultural occupation is the reference category for husband's occupation. Agricultural occupation is a category in every survey with data on husband's occupation and is frequently the most prevalent occupation. Indonesia 2012 DHS, Cambodia 2014 DHS, and Philippines 2013 DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status. India 2005-06 DHS (NFHS-3) and Indonesia 2012 DHS capture husband's current employment status as a separate occupational category and categorize husband's occupation only for husbands who are currently working. As with women's occupation, no data on the husband's occupation are available in the Bangladesh DHS. In India, there is no differentiation between skilled and unskilled manual labor. In Nepal, there is no separate category for husbands working in sales. These respondents are combined with those working in "other" occupations.

2.5. Scope of the Analysis and Analytic Strategy

In the following sections, this study describes overall trends in the age at marriage and first birth. This depiction of trends uses the median ages at marriage and first birth, as completed age in years, using every DHS survey as a data point. Although medians are a more stable measure of central tendency for distributions with right-hand skew, they are a more crude measure of the age of these events because they are calculated from age in completed years, rather than months (Rutstein and Rojas 2006). The purpose of this section is to provide an overview of trends over time in the age at marriage, age at first birth, and the interval between marriage and the first birth, as well as to discern any regional patterns in these events.

Different population subgroups may exhibit distinctive patterns in the timing of the first birth. These differences may be due, in part, to distinctive patterns in marriage age. In the subsequent two sections, therefore, the study extends its analysis of trends over time by initiating an examination into the compositional shifts, first in marriage age and secondly, in the first birth interval. This study specifically investigates the distribution across background characteristics in the mean age at marriage and mean length of the first birth interval, respectively. These two sections present data at two points of time: the most recent DHS survey (Survey 2) and a DHS survey approximately one decade earlier (Survey 1). This time point is selected for Survey 1 so that it includes as many variables that describe the gender context as possible; earlier surveys often exclude these measures.

Two statistical tests are shown. The first is a test for the significance of the difference in means between surveys, disaggregated by each background characteristic. The test detects if change in marriage and first birth patterns is occurring in a common manner for all groups of the population, whether changing trends are concentrated within certain segments of the population, or whether there are divergent trends in opposing directions for the different groups.

The second statistical test is a test of independence to determine to what extent each background characteristic may be associated alternately with marriage age and the first birth interval. Because the test is repeated at both Survey 1 and Survey 2, changes in the association of background characteristics with these outcomes can also be detected. Sample sizes on which marriage age patterns and trends are analyzed are presented in Appendix Table 1.

With the principal outcome—the first birth interval—the time to event is of interest. Therefore, this is analyzed in a survival analysis framework. This approach allows us to use data on all respondents, whether or not they have experienced the failure event (first birth) in question, while accounting for right censoring beyond the observation period. Therefore, in this section, the means in the survival experience are reported. Specifically, an extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored for those women who have not experienced a first birth by the time they were interviewed. Differences in means are assessed with a Tarone-Ware test for the equality of survivor functions across groups and survey years (Tarone and Ware 1977). Similar to the Wilcoxon test, the Tarone-Ware test is appropriate when hazard functions may vary non-proportionally across groups. The Tarone-Ware test gives greater weight than the Wilcoxon test to earlier failure times, when more cases are at risk (Cleves et al. 2010; Tarone and Ware 1977). Sample sizes, including the number of cases who experience failure (had a first birth) and the total person-months of observation contributed by the sample, are presented in Appendix Table 2.

Next, the study compares the association of marriage age with the first birth interval first in bivariate and multivariate hazard models. These models also identify other background characteristics that may be associated with the first birth interval, independent of marriage age. Multivariate models control for birth cohort to account for period shifts in the timing of marriage and childbearing; gender context (women's decision-making, attitudes toward wife beating, and spousal age difference); socio-demographic characteristics (education, occupation, household wealth, religion, place of residence, and subnational region); and husband's characteristics (education and occupation).

Hazard models are estimated as loglogistic accelerated failure time (AFT) models using data from the most recent DHS survey, with time ratios (i.e. exponentiated coefficients) reported for ease of interpretation (Allison 1995; Box-Steffensmeier and Jones 2004). The loglogistic distribution was selected as the best or second-best fitting distribution in each country, as assessed by the low Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) from tests for non-nested hazard models (Box-Steffensmeier and Jones 2004; Cleves et al. 2010). Results of model diagnostics are reported in Appendix Table 3. The loglogistic AFT model is a fully parametric hazard model in which hazards are not assumed to be proportional, which prior research has suggested may not be the case with covariates of the first birth (Trussell and Bloom 1983). The loglogistic model implies a hazard distribution *h(t)* that is unimodal and not necessarily monotonic, with the scale of the logistic-distributed baseline hazard[3] estimated by γ (Allison 1995; Box-Steffensmeier and Jones 2004). When γ approaches 0.5, as it does in this study's models, it implies an underlying hazard that quickly increases with time

[3] As such, the log-logistic hazard model is analogous to the logit model for discrete dependent variables.

upon the onset of risk (marriage) before declining with a long tail as time increases[4] (Allison 1995; Cleves et al. 2010).

This study then estimates a multivariate decomposition analysis of the first birth interval. This analysis uses data from both Survey 1 and Survey 2 to examine whether changes in the first birth interval over time are due to changes in the levels/distribution of marriage age, or whether the influence of marriage age on the first birth interval has changed over time. The multivariate models use the same measures to describe the gender context, and women's socio-demographic and husband's characteristics as in the hazard models. This allows analysis of the extent to which changes in the first birth interval are due to compositional changes in the population other than changes in age at marriage, or differences in their influence on the first birth interval between surveys.

The multivariate decomposition models are estimated using the mvdcmp commands available in Stata 14.1 (Powers, Yoshioka, and Yun 2011). This form of decomposition extends Oaxaca-Blinder decomposition techniques to non-linear models such as those handling hazard rates as well as observed difference in group means or proportions (Blinder 1973; Oaxaca 1973; Powers and Yun 2009). The mvdcmp multivariate decomposition procedure has several advantages for this study. The method allows for overall decomposition into the composition component (also known as the characteristics or endowments component) and the effects component (also known as the coefficients or rate component). It also allows for a detailed decomposition of each variable in the model. The second advantage is a correction for the problem of path dependence, in which a nonlinear decomposition is sensitive to the *order* in which variables are entered into the model, or to the selection of the reference category of dichotomous covariates, by applying a normalized decomposition.

A piece-wise constant exponential decomposition model is both computationally complex, requiring a dummy variable for each person-period of observation (months), and assumes a proportional hazard across groups that is inappropriate for these data. Instead, I opt for a linear regression decomposition, partitioning the observed group mean into its composition and effects components. The linear regression conveniently produces exponentiated coefficients that are similar in interpretation to the time ratios presented for the hazard models in this study. However, the coefficients from a linear model may be biased if excessive right censoring is present. Fortunately, as shown earlier, the vast majority of observed cases fail (have a first birth) during the period of observation, and this mitigates the extent of such bias. To assess the extent to which the linear form of the decomposition model is sensitive to any such bias present in the data, the β coefficients for a simple linear regression model are compared with those of a loglogistic model for each country at Survey 2. The results of this sensitivity analysis are presented in Appendix Table 6. The results indicate minor variations in the detected significance level for certain categories of selected variables, including several categories of borderline significance (p value close to the $p \leq 0.05$ threshold) that appear to be significant in one model and non-significant in another. However, the failure to detect significant associations or to falsely detect a significant association is not systematic across surveys, nor were any discrepancies found in the direction of associations.

The final analysis presented in this study examines the implications of marriage age on subsequent birth spacing. Specifically, the study estimates hazard models of the second birth interval. This analysis is based on all women in the analytic samples who have had a first birth. As with the hazard models for the first birth interval, the second birth interval is estimated with loglogistic accelerated failure time models that report results in time ratios. As with the earlier hazard models, the sample sizes, observed failures, and person-months of observation contributed are displayed in Appendix Table 13. Model diagnostics, including the AIC and BIC, which were used to select the hazard form, are displayed in Appendix Table 14.

[4] This hazard function is remarkably similar to a lognormal distribution in which $\sigma=1$.

These models use age at marriage and the same covariates that are used to estimate the hazard of the first birth interval. In addition, a categorical measure that describes the duration of the first birth interval are entered into the models. The inclusion of this measure indicates whether marriage age has an independent effect on the second birth interval or if it influences it at all, does so only through its effect on the duration of the first birth interval. The categorical measure of the duration of the first birth interval aligns roughly with terciles in South and Southeast Asian countries in the first birth interval. For South Asian countries, the categories are less than 16 months, 16-32 months, and greater than 32 months. In Southeast Asian countries, the categories are less than 12 months, 12-22 months, and greater than 22 months. Data on the observed terciles for each study country at the most recent survey are available in Appendix Table 15.

3. Trends in Median Age at Marriage and Age at First Birth

Figure 1 in this section displays the median completed age at marriage and first birth among women age 25-49 for the seven countries in this study. In addition to data from the most recent survey, this section draws upon data from all DHS surveys conducted in study countries to describe trends. The presented trends data cover approximately 15-20 years[5]. Figure 1 reflects two separate regional patterns in marriage age and first birth. Subsequent sections will present results with study countries grouped regionally.

3.1. Marriage and the First Birth in South Asia

The data for Bangladesh, India, Nepal, and Pakistan indicate that marriage in a phenomenon of adolescence. In these South Asian countries, the median completed age at marriage ranges from age 15.8 in Bangladesh to age 19.5 in Pakistan. India and Nepal are similar to one another with a median age at marriage of about age 17.5.

The median completed age at marriage has increased most rapidly in Nepal and Bangladesh, and has increased the least—by just 6 months over 13 years—in India. In Bangladesh, the median completed age at marriage has increased from age 14.1 in 1993-94 to age 15.8 in 2014, with most of that increase occurring in the last 10 years.

The onset of childbearing is an event that occurs during adolescence for more than half of women in Bangladesh and India. However, the median completed age at first birth is in the early 20s in Nepal and Pakistan. Until the most recent survey, the median completed age at first birth was less than age 20 in Nepal as well. Like the median completed age at marriage, the median completed age at first birth has also increased over time although it has increased more slowly than marriage age. The rate of increase has been slowest in Nepal, which experienced the most rapid increase in marriage age. Here, the median completed age at first birth increased by nearly 5 months over the 15 years. In contrast, the median completed age at first birth increased by nearly 11 months over 12 years in Pakistan, keeping pace with the increase in age at marriage there. The increase in the median completed age at first birth in Bangladesh and India are similar to one another and are between that of Nepal and Pakistan. However, the pace of change has increased in Bangladesh between 2004 and 2014; this nearly approaches the pace of change in Pakistan.

[5] A standard DHS has not been conducted in Cambodia prior to 2000; therefore, one decade of data is presented for Cambodia.

Figure 1a. Trends in the median completed age at key events among women age 25-49 in four South Asian countries

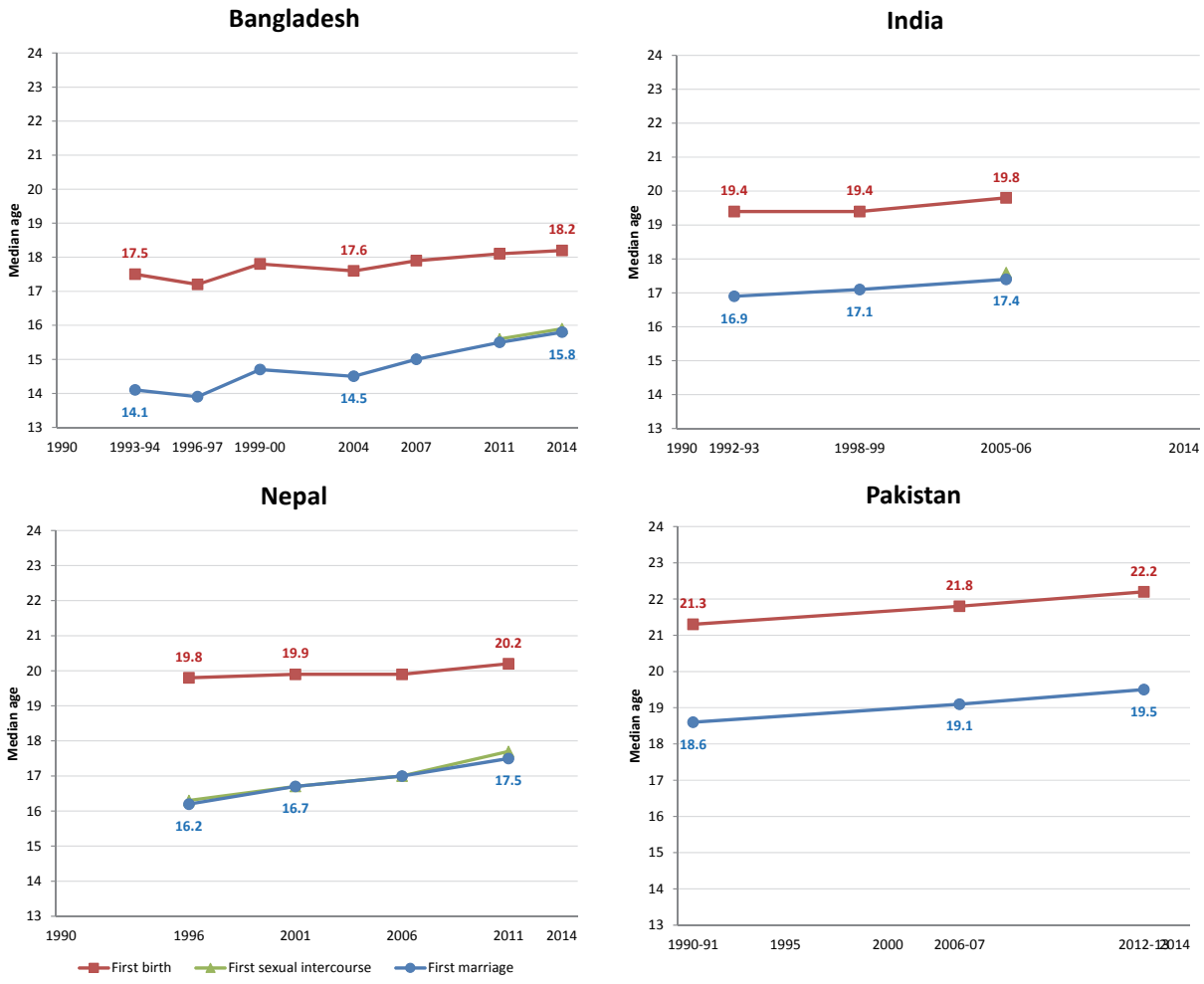
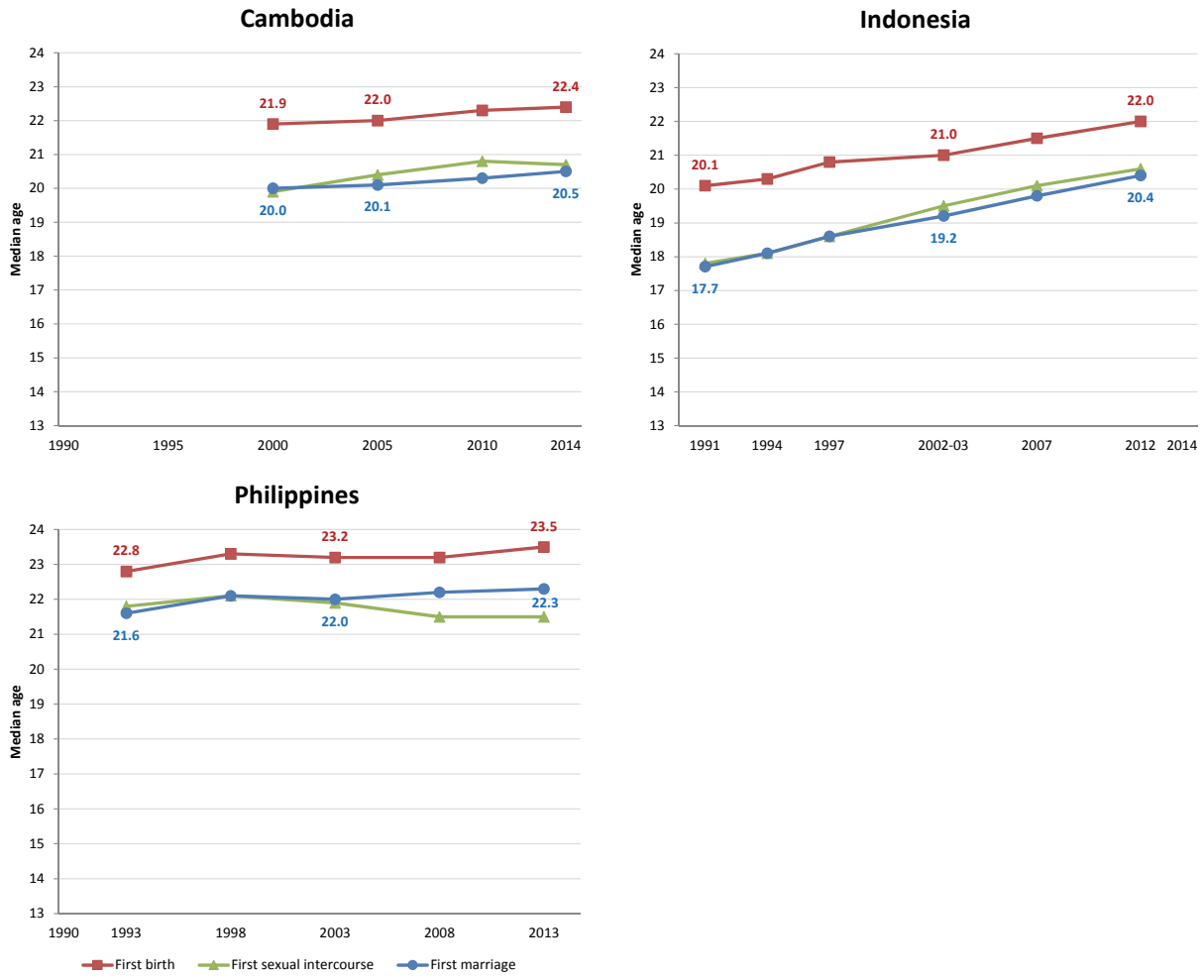


Figure 1b. Trends in the median completed age at key events among women age 25-49 in three Southeast Asian countries



The interval between the median completed age at marriage and first birth has narrowed over time (except in Pakistan) because the age at marriage has increased more quickly than age at first birth. There is little variation across the four South Asian countries in the difference between the median completed ages at first birth and marriage. The difference is 2.4 years in Bangladesh and India, and 2.7 years in Nepal and Pakistan.

3.2. Marriage Age and First Birth in Southeast Asia

In contrast to the four South Asian countries in this study, the median completed age at marriage is older than the adolescent years in the three Southeast Asian countries studied here, with ranges from age 20.4 in Indonesia to age 22.3 in the Philippines. For two countries—Cambodia and the Philippines—the median completed age at marriage has been in the 20s for all survey data points. In Indonesia, the median completed age at marriage did not cross this threshold until the most recent survey in 2012.

Indonesia shows the most rapid increase in median completed age at marriage, not just among the three Southeast Asian countries, but among all seven countries. The age has increased from age 17.7 in 1991 to 20.4 in 2012. The pace of change in Cambodia and the Philippines resembles that seen in India.

The median completed age at first birth ranges from age 22 in Indonesia to age 23.5 in the Philippines. The fastest pace of change of all study countries has also occurred in Indonesia, with the median completed age at first birth rising approximately two years between 1991 and 2012. In Cambodia and the Philippines, the rate of change has been more modest and has kept pace with the increase in marriage age.

The difference in median completed ages at first birth and marriage among the Southeast Asian countries ranges from 1.2 years in the Philippines, where age at marriage is the highest, to 1.9 years in Cambodia. This stands in contrast to the difference found in South Asia, which is two and a half years or more. The difference between median completed ages at first birth and marriage has remained steady in Cambodia and the Philippines. In Indonesia, the slower increase in the median completed age at first birth compared to that in the median completed age at marriage results in a narrowing of their difference over time. In 1991, the median completed age at these events was separated by 2.4 years, which is similar to the difference currently observed among the South Asian countries in the study. In 2012, as marriage age transitioned from the adolescent years to the 20s, it has narrowed to 1.6 years; this resembles the difference observed among the other two Southeast Asian countries studied here.

3.3. Age at First Sex

This study does not focus on the timing of first sex in its examination of the dynamics of marriage age and the first birth interval. Nonetheless, it may be of interest to examine to what degree marriage coincides with sexual exposure. The median completed age at first sex, where available[6], is also displayed (in green) in Figures 1a and 1b. These data indicate that, overall, the median completed age at first sex tracks very closely with the median completed age at marriage. These ages are almost identical in Bangladesh, India, and Nepal, while there has sometimes been a slight difference between these ages in Cambodia and Indonesia. In the Philippines, the median completed age at first sex and at marriage have coincided up through 2003. However, the median completed age at first sex has been younger than that at marriage since 2008. First sex and marriage are separated by nearly 10 months at the most recent survey.

[6] Data on age at first sex were not collected in some early DHS surveys in Bangladesh and India; no data on age at first sex have been collected in any Pakistan DHS.

4. Characteristics Associated with Age at Marriage

Tables 4-14 in this section show the distribution across background characteristics of the mean age at marriage among ever-married women age 20-49 and the results of tests of significance of the association between each background characteristic and the age at marriage. These tables show the means and associations with background characteristics at two time points for each study country: the most recent DHS survey (Survey 2) and a DHS survey approximately 10 years prior[7] (Survey 1). These tables also show the positive (increasing age at marriage) or negative difference (declining age at marriage) for each background characteristic and results that test the statistical significance of the change. Sample sizes are shown in Appendix Table 1.

Table 3 shows the total change in the mean age at first marriage in the seven study countries. The change in the mean age at marriage has been statistically significant in all seven study countries, in South Asia and Southeast Asia alike. Among the South Asian countries, mean age at marriage has increased by 0.4 to 0.9 year between surveys (p=0.000). In Southeast Asia, the increase between surveys has been more modest in Cambodia (0.3, p=0.000) and the Philippines (0.2, p=0.013). However, the largest increase is in the Philippines, where the mean age at marriage rose by 1.25 years between 2003 and 2013 (p=0.000).

Table 3. Change in the mean age at first marriage among ever-married women age 25-49

	Survey 1			Survey 2			Difference survey 1-survey 2	p-value[1]
Country	Mean	CI		Mean	CI			
South Asia								
Bangladesh	**2004**			**2014**				
	15.28	15.16	15.41	16.21	16.09	16.33	0.93	***
India	17.39	17.32	17.46	17.76	17.70	17.82	0.4	***
Nepal	**2001**			**2011**				
	17.16	16.99	17.32	17.93	17.73	18.14	0.78	***
Pakistan	**2006-07**			**2012-13**				
	19.20	19.05	19.35	19.69	19.49	19.89	0.49	***
Southeast Asia								
Cambodia	**2005**			**2014**				
	20.33	20.22	20.44	20.64	20.52	20.77	0.31	***
Indonesia	**2002-03**			**2012**				
	19.24	19.08	19.39	20.49	20.34	20.64	1.25	***
Philippines	**2003**			**2013**				
	21.76	21.63	21.89	22.00	21.86	22.14	0.24	*

[1] p-value of significance test for the difference in means between surveys.

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

4.1. Marriage Age and Gender Context

Three variables describe the gender context and its possible association with age at marriage. These are the number of decisions in which women are involved, attitudes toward wife beating, and spousal age difference. Data that show the mean age at marriage according to each of these variables, respectively, are found in Tables 4-6. India and Pakistan surveys did not collect data on women's decision-making and wife beating attitudes at Survey 1 and, in Bangladesh, neither survey collected data on wife beating

[7] Surveys in India and Pakistan, which are approximately 6 years apart, are the exception.

attitudes. Thus, change in marriage age according to these characteristics cannot be assessed for these countries.

Table 4. Mean age at first marriage among ever-married women age 25-49, by women's decision-making

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Number of decisions	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
			2004				**2014**				
					***				***		
	0	15.07	14.88	15.26		16.11	15.96	16.26		1.04	***
Bangladesh	1	15.15	14.94	15.35		16.01	15.78	16.25		0.87	***
	2	15.45	15.24	15.66		15.98	15.79	16.18		0.54	***
	3	15.38	15.24	15.53		16.45	16.31	16.59		1.07	***
	Total	15.28	15.16	15.41		16.21	16.09	16.33		0.93	***
			1998-99				**2005-06**				
									***		
	0	na	na	na		17.37	17.26	17.47		--	--
India	1	na	na	na		17.75	17.64	17.86		--	--
	2	na	na	na		17.73	17.64	17.83		--	--
	3	na	na	na		18.04	17.96	18.13		--	--
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.4	***
			2001				**2011**				
					ns				ns		
	0	17.20	17.02	17.38		17.88	17.55	18.21		0.68	***
Nepal	1	17.08	16.83	17.34		18.08	17.76	18.41		1.00	***
	2	17.18	16.95	17.42		17.94	17.65	18.23		0.76	***
	3	17.13	16.93	17.32		17.93	17.72	18.15		0.80	***
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07				**2012-13**				
									**		
	0	na	na	na		19.95	19.68	20.22		--	--
Pakistan	1	na	na	na		20.02	19.62	20.42		--	--
	2	na	na	na		19.60	19.27	19.93		--	--
	3	na	na	na		19.52	19.30	19.74		--	--
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***
Southeast Asia											
			2005				**2014**				
					ns				ns		
	0	s	s	s		20.39	19.48	21.31		2.33	*
Cambodia	1	20.62	19.42	21.82		21.67	20.73	22.61		1.05	ns
	2	20.33	19.85	20.81		20.66	20.32	20.99		0.32	ns
	3	20.51	20.30	20.72		20.59	20.45	20.72		0.08	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03				**2012**				
					***				***		
	0	18.84	18.14	19.54		19.88	19.53	20.23		1.04	**
Indonesia	1	18.69	18.35	19.02		20.06	19.73	20.38		1.37	***
	2	18.93	18.69	19.17		20.11	19.88	20.33		1.17	***
	3	19.39	19.24	19.55		20.73	20.58	20.88		1.34	***
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***

Continued

Table 4—*Continued*

Country	Number of decisions	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
		2003			ns	2013			ns		
Philippines	0	22.36	20.95	23.77		*22.69*	*21.22*	*24.16*		0.33	ns
	1	21.85	21.35	22.36		21.62	20.52	22.72		-0.23	ns
	2	21.82	21.38	22.25		22.35	21.79	22.91		0.53	ns
	3	21.64	21.34	21.94		21.86	21.58	22.14		0.22	ns
	4	21.76	21.61	21.91		22.06	21.91	22.21		0.30	**
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

na indicates indicator is not available for the survey. No data on women's decision-making were collected in the 1998-99 India DHS (NFHS-2) or the 2006-07 Pakistan DHS.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

4.1.1. Decision-making

The number of decisions in which women participate is significantly associated with marriage age in 4 of 7 study countries: Bangladesh, India, Pakistan, and Indonesia. There is no such relationship in Nepal, Cambodia, or the Philippines. The salience of women's decision-making to marriage age has remained static over time: there was also no association between these variables in Survey 1 in Nepal, Cambodia, and Philippines, while the association is detected in both survey waves in Bangladesh and Indonesia[8].

In general, marriage age rises with participation in more decisions, although this increase is not straightforwardly monotonic. In Pakistan 2012-13, the mean age at marriage is highest among women who participate in one decision, and slightly lower among women who participate in 2 or 3 decisions.

Marriage age has increased over time across all levels of decision-making in Bangladesh, Nepal, and Indonesia. Significant increases are seen only among women who make four decisions in the Philippines (p=0.007). While the average age at marriage rose by about one third of a year (p=0.000) between 2005 and 2014 in Cambodia, the average age at marriage rose by 2.3 years (p=0.032) among women who participate in no decisions here—the largest decadal increase in the study. Observed increases among women with more decision-making capability are not statistically significant. While women of all decision-making capabilities experienced sizable increases in marriage age in Indonesia, the increases among women participating in some (1-3) decisions outpaced that among women making no decisions. Indonesia shows the largest increases in marriage age, after the increase among women making no decisions in Cambodia.

4.1.2 Attitudes toward wife beating

Attitudes toward wife beating are significantly associated with marriage age in five of the six countries[9] for which it could be assessed at the most recent survey. Only in Nepal[10] is no association detected. Wife

[8] Change in the association over time cannot be assessed in India or Pakistan since these data were not collected in Survey 1.

[9] Data on attitudes toward wife beating were not collected in Bangladesh DHS surveys.

beating attitudes have become more salient over time in Cambodia; no association with marriage age was detected in 2005.

Table 5. Mean age at first marriage among ever-married women age 25-49, by attitudes toward wife beating

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Wife beating attitudes	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
			1998-99				**2005-06**				
									***		
India	Acceptable in at least one scenario	na	na	na		17.26	17.20	17.33		--	--
	Rejects in all scenarios	na	na	na		18.26	18.17	18.34		--	--
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.4	***
			2001				**2011**				
					ns				ns		
Nepal	Acceptable in at least one scenario	17.11	16.88	17.34		17.05	15.30	18.80		-0.06	ns
	Rejects in all scenarios	17.17	17.02	17.33		17.94	17.76	18.12		0.77	***
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07				**2012-13**				
									***		
Pakistan	Acceptable in at least one scenario	na	na	na		19.12	18.92	19.31		--	--
	Rejects in all scenarios	na	na	na		20.13	19.90	20.36		--	--
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***

Continued

[10] In the Nepal 2011 survey, but not the 2001 survey, a filter question was inserted and respondents answering "no" when asked, "In your opinion, should a husband hit or beat his wife for any reason at all?" were not asked if wife beating was justified in specific scenarios. This questionnaire change may result in a measurement change (decrease) in the prevalence of attitudes accepting of wife beating as well as in detecting any associations with this variable.

Table 5—*Continued*

Country	Wife beating attitudes	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005		ns		**2014**		**		
Cambodia	Acceptable in at least one scenario	20.40	20.18	20.62		20.52	20.36	20.67		0.12	ns
	Rejects in all scenarios	20.58	20.22	20.94		20.79	20.63	20.96		0.22	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002		*		**2012**		***		
Indonesia	Acceptable in at least one scenario	19.03	18.82	19.24		20.01	19.84	20.17		0.98	***
	Rejects in all scenarios	19.32	19.15	19.48		20.73	20.57	20.89		1.42	***
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003		***		**2013**		***		
Philippines	Acceptable in at least one scenario	20.80	20.59	21.01		20.98	20.70	21.26		0.18	ns
	Rejects in all scenarios	22.11	21.96	22.26		22.16	22.02	22.31		0.06	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

na indicates indicator is not available for the survey. No data on women's decision-making was collected in the 1998-99 India DHS (NFHS-2) nor the 2006-07 Pakistan DHS.

In the Nepal 2011 survey, but not the 2001 survey, a filter question was inserted and respondents answering "no" when asked, "In your opinion, should a husband hit or beat his wife for any reason at all?" were not asked if wife beating was justified in specific scenarios. This questionnaire change may result in a measurement change (decrease) in the prevalence of attitudes accepting of wife beating as well as in detecting any associations with this variable.

In all study countries, mean age at marriage is older among women who reject wife beating in any scenario and younger among women who find wife beating is acceptable in at least one scenario. The largest differences are found in Indonesia where women rejecting wife beating married 1.2 years older (p=0.000) and in India and Pakistan where women rejecting wife beating married about 1 year older (p=0.000) than did their counterparts who find wife beating acceptable. In Indonesia, marriage age rose from 2002-03 to 2012 among all women, but the increase is particularly pronounced for women who reject wife beating (1.4 years, p=0.000).

4.1.3. Spousal age difference

Table 6 shows the mean age at marriage according to spousal age difference. Spousal age difference refers to the number of years by which the husband is older than the wife. Spousal age difference is significantly associated with marriage age in all 7 study countries and this association has been equally significant at both points in time.

Table 6. Mean age at first marriage among ever-married women age 25-49, by spousal age difference

Country	Spousal age difference	Survey 1				Survey 2				Difference survey 1-survey 2	p-value[2]
		Mean	CI		p-value[1]	Mean	CI		p-value[1]		
South Asia											
			2004				**2014**				
					***				***		
	0-2 years	17.71	17.13	18.28		18.12	17.73	18.50		0.41	ns
Bangladesh	3-5 years	15.88	15.64	16.13		16.81	16.59	17.02		0.93	***
	6-10 years	15.24	15.11	15.38		16.16	16.01	16.31		0.91	***
	More than 10 years	14.82	14.69	14.95		15.57	15.46	15.69		0.76	***
	Total	15.28	15.16	15.41		16.21	16.09	16.33		0.93	***
					***				***		
	0-2 years	18.43	18.33	18.53		18.92	18.82	19.02		0.49	***
India	3-5 years	17.68	17.60	17.75		17.85	17.78	17.93		0.18	**
	6-10 years	17.09	17.02	17.17		17.39	17.31	17.47		0.30	***
	More than 10 years	16.40	16.30	16.49		16.74	16.64	16.85		0.35	***
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.4	***
			2001				**2011**				
					***				***		
	0-2 years	17.87	17.67	18.07		18.68	18.45	18.92		0.81	***
Nepal	3-5 years	16.75	16.57	16.93		17.62	17.37	17.86		0.87	***
	6-10 years	16.70	16.54	16.87		17.33	17.09	17.57		0.63	***
	More than 10 years	17.09	16.75	17.42		17.47	17.00	17.93		0.38	ns
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07				**2012-13**				
					***				***		
	0-2 years	20.39	20.14	20.65		20.99	20.68	21.31		0.60	**
Pakistan	3-5 years	19.28	19.04	19.51		19.61	19.40	19.82		0.33	*
	6-10 years	18.61	18.40	18.81		19.07	18.83	19.31		0.46	**
	More than 10 years	17.96	17.64	18.28		18.18	17.89	18.47		0.22	ns
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***

Continued

Table 6—*Continued*

Country	Spousal age difference	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005				**2014**				
					***				***		
	0-2 years	21.08	20.93	21.22		21.50	21.32	21.67		0.42	***
Cambodia	3-5 years	19.17	18.99	19.35		19.63	19.42	19.85		0.47	***
	6-10 years	19.15	18.88	19.42		19.40	19.10	19.70		0.25	ns
	More than 10 years	20.05	19.55	20.55		20.14	19.62	20.66		0.08	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03				**2012**				
					***				***		
	0-2 years	21.01	20.80	21.21		22.58	22.40	22.77		1.58	***
Indonesia	3-5 years	18.98	18.78	19.17		20.09	19.92	20.25		1.11	***
	6-10 years	18.05	17.87	18.24		18.97	18.80	19.14		0.92	***
	More than 10 years	17.57	17.30	17.84		18.22	17.95	18.49		0.65	***
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003				**2013**				
		7,377			***	8,290			***		
	0-2 years	23.01	22.83	23.18		23.16	22.99	23.34		0.16	ns
Philippines	3-5 years	20.64	20.43	20.85		20.94	20.72	21.16		0.31	ns
	6-10 years	20.14	19.85	20.42		20.69	20.44	20.95		0.56	**
	More than 10 years	20.50	20.03	20.97		20.40	20.04	20.76		-0.10	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

The universal pattern is a negative association between spousal age difference and marriage age (p=0.000). With larger differences between spousal ages, mean age at marriage decreases monotonically. The differences in marriage age between those with the largest and smallest spousal age gap are generally larger in the Southeast Asian than in South Asian countries. These groups are separated by 4.4 years in Indonesia and 2.8 years in the Philippines. Cambodia exhibits a pattern similar to the South Asian countries in the study, where the marriage age is 1.2 to 2.8 years younger among women with largest spousal age difference. The South Asian countries also generally have a higher proportion of women in marriages characterized by a larger spousal age difference as compared to Southeast Asian countries where a greater proportion of women have smaller age differences with their spouse (data not shown).

A significant increase in marriage age over time has been more universal across all levels of spousal age difference in the South Asian countries than in the Southeast Asian countries in the study. In Bangladesh, India, Nepal, and Pakistan, marriage age has increased among all women except those with 0-2 spousal age gap in Bangladesh and those with more than 10 years age difference in Nepal and Pakistan. Within this group, the largest absolute differences occur among women with less than 10 years age difference in Nepal and more than 2 years age difference in Bangladesh. However, after correcting for the shorter inter-survey time period in India and Pakistan, women with 0-2 years spousal age difference have seen increases in marriage age of the same size as in Bangladesh and Nepal. In general, the increase in marriage age is more pronounced among women with less spousal age gap in these four countries.

Like the South Asian countries in the study, Indonesia has seen significant increases in marriage age among women of all spousal age differences. These increases are more pronounced among women with

age differences of 0-2 or 3-5 years than among women with 6-10 or more than 10 years. Here, marriage age increased by 1.6 years between 2002-03 and 2012 among women with 0-2 years spousal age difference—the largest increase in the study. However, the increase in marriage age is concentrated among certain groups in Cambodia and the Philippines. In Cambodia, marriage age increased for women having 0-2 or 3-5 years spousal age difference, but not among women with larger spousal age gaps. In the Philippines, only women with a spouse 6-10 years their elder experienced an increase in average marriage age (p=0.004). The observed increase of nearly one-third of a year between 2003 and 2013 among women with a spousal age difference of 3-5 years is nearly significant (p=0.052).

4.2. Marriage Age and Education and Occupation

4.2.1. Education

Table 7 shows the mean age at marriage according to level of education in a similar format to the tables in the previous section. The data show that education is associated with marriage age at a significance level of p=0.000 at both survey points in all 7 study countries.

Table 7. Mean age at first marriage among ever-married women age 25-49, by level of education

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Education	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
			2004		***		2014		***		
	No education	14.65	14.53	14.76		15.16	15.01	15.31		0.52	***
Bangladesh	Primary	15.01	14.86	15.17		15.54	15.41	15.67		0.53	***
	Secondary	16.22	16.03	16.41		16.77	16.61	16.93		0.55	***
	Higher	20.97	20.46	21.48		21.04	20.75	21.33		0.07	ns
	Total	15.28	15.16	15.41		16.21	16.09	16.33		0.93	***
			1998-99				2005-06				
	No education	16.19	16.14	16.23		16.43	16.38	16.48		0.24	***
India	Primary	17.14	17.05	17.22		17.22	17.13	17.31		0.08	ns
	Secondary	18.98	18.89	19.07		19.15	19.07	19.24		0.17	**
	Higher	22.11	21.98	22.24		23.14	23.00	23.29		1.03	***
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.37	***
			2001		***		2011		***		
	No education	16.88	16.72	17.03		17.05	16.86	17.24		0.17	ns
Nepal	Primary	17.52	17.27	17.77		17.62	17.36	17.88		0.10	ns
	Secondary	18.70	18.37	19.04		19.32	19.07	19.56		0.61	*
	Higher	21.63	20.81	22.44		22.55	22.14	22.95		0.92	*
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07		***		2012-13		***		
	No education	18.54	18.37	18.71		18.66	18.46	18.87		0.12	ns
Pakistan	Primary	19.37	19.05	19.68		19.46	19.19	19.73		0.09	ns
	Secondary	20.40	20.06	20.74		21.06	20.76	21.35		0.66	**
	Higher	22.76	22.35	23.16		23.86	23.56	24.16		1.11	***
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***

Continued

Table 7—*Continued*

Country	Education	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005				**2014**				
					***				***		
	No education	20.19	20.00	20.39		19.96	19.66	20.26		-0.23	ns
Cambodia	Primary	20.19	20.05	20.32		20.41	20.26	20.56		0.22	*
	Secondary	20.97	20.75	21.18		21.32	21.12	21.52		0.35	*
	Higher	***24.10***	***22.54***	***25.66***		23.97	23.49	24.46		-0.13	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03				**2012**				
					***				***		
	No education	17.30	16.98	17.61		17.58	17.08	18.07		0.28	ns
Indonesia	Primary	17.89	17.75	18.03		18.41	18.27	18.54		0.51	***
	Secondary	21.17	21.03	21.31		21.55	21.43	21.67		0.38	***
	Higher	24.90	24.61	25.19		25.31	25.07	25.54		0.41	*
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003				**2013**				
		7,377			***	8,290			***		
	No education	18.21	17.47	18.94		18.58	17.84	19.32		0.37	ns
Philippines	Primary	19.95	19.75	20.16		19.79	19.56	20.02		-0.16	ns
	Secondary	21.32	21.14	21.49		21.46	21.31	21.61		0.15	ns
	Higher	24.38	24.19	24.57		24.40	24.21	24.59		0.02	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

In all study countries, there is a monotonically positive relationship between education and marriage age. The largest disparities by education are in Indonesia where women with higher education married when they were, on average, 7.7 years older than did those with no education in 2012 and in India, where women with higher education married 6.7 years older than those with no education in 2005-06. This is followed by Bangladesh and the Philippines where the disparity between education groups approaches 6 years at Survey 2.

There have been significant increases in average marriage age over time in multiple education categories—usually in the more educated groups of women—in six of seven study countries. In Bangladesh, however, marriage age has increased among all educational categories except women with higher education. In India, marriage age has increased among women with no education alongside women with secondary or higher education (but not primary education) while in Cambodia, increases are seen only among women with primary or secondary education. There have been no significant changes in marriage age in any educational category in the Philippines.

The biggest increase over time is seen among women with higher education in India, whose mean age at marriage increased from age 22.1 in 1998-99 to age 23.1 in 2005-06 (p=0.000). The increases in marriage age concentrated among women with secondary or higher education or the increases among women in these groups that have outpaced increases among women with lower education means that the disparities in marriage age across educational groups have widened over time in several countries. The widening disparities are most notable in India, Nepal, and Pakistan. The growing disparities are more modest in Cambodia and Indonesia, while the disparities have narrowed slightly in the Philippines and Bangladesh.

4.2.2. Occupation

As shown in Table 8, women's occupation is associated with marriage age in all study countries[11] but Cambodia at the time of the most recent survey. In Indonesia, occupation has become salient over time; there was no significant association with marriage age in 2002-03, but by 2012, this association was statistically significant (p=0.000).

Table 8. Mean age at first marriage among ever-married women age 25-49, by respondent's occupation

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Occupation	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
			1998-99				2005-06				
					***				***		
	Not working	17.83	17.77	17.90		18.24	18.17	18.32		0.41	***
	Agricultural	16.10	16.02	16.17		16.48	16.40	16.55		0.38	***
	Professional/technical/ managerial	21.51	21.25	21.78		22.39	22.12	22.67		0.88	***
India	Clerical	22.31	21.77	22.85		21.27	20.79	21.74		-1.04	**
	Sales	17.36	17.09	17.63		17.93	17.68	18.18		0.57	***
	Services	17.37	16.96	17.77		17.39	17.21	17.57		0.02	ns
	Skilled/unskilled manual	17.01	16.88	17.15		17.44	17.31	17.58		0.43	***
	Other	16.73	16.04	17.43		19.47	18.53	20.41		2.74	***
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.4	***
			2001				2011				
					**				**		
	Not working	17.36	17.03	17.69		18.58	18.17	19.00		1.23	***
	Agricultural	17.04	16.88	17.21		17.43	17.24	17.61		0.39	**
	Professional/technical/ managerial	19.29	18.52	20.07		21.38	20.86	21.89		2.09	***
Nepal	Clerical	s	s	s		19.37	18.00	20.73		3.37	**
	Services	s	s	s		18.63	18.26	19.01		2.87	***
	Skilled manual	18.66	17.98	19.34		18.21	17.73	18.70		-0.45	ns
	Unskilled manual	*16.24*	*15.45*	*17.03*		17.15	16.57	17.72		0.91	ns
	Other	17.59	17.14	18.05		s	s	s		3.11	*
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07				2012-13				
					***				***		
	Not working	19.52	19.35	19.69		20.00	19.82	20.17		0.47	***
	Agricultural	17.78	17.40	18.16		18.33	17.78	18.88		0.56	ns
	Professional/technical/ managerial	21.85	21.09	22.60		22.88	22.07	23.69		1.03	ns
Pakistan	Clerical	s	s	s		s	s	s		4.82	ns
	Sales	18.13	17.28	18.97		18.47	17.49	19.46		0.35	ns
	Services	18.50	18.19	18.82		19.15	18.77	19.54		0.65	**
	Skilled manual	18.65	17.88	19.43		18.38	17.79	18.96		-0.28	ns
	Unskilled manual	18.22	17.73	18.71		18.58	18.20	18.95		0.35	ns
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***

Continued

[11] Women's occupation is not available in the Bangladesh DHS surveys included in this study.

Table 8—*Continued*

Country	Occupation	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005				**2014**				
					ns				ns		
	Not working	19.57	18.41	20.73		20.95	20.69	21.21		1.38	*
	Agricultural	20.19	20.04	20.34		20.18	19.99	20.37		-0.01	ns
	Professional/technical/ managerial	22.49	21.77	23.21		22.57	22.10	23.03		0.07	ns
Cambodia	Clerical	22.95	21.48	24.41		22.35	21.13	23.57		-0.60	ns
	Sales	20.36	20.15	20.57		20.59	20.37	20.81		0.23	ns
	Services	20.56	19.63	21.49		20.84	20.35	21.33		0.28	ns
	Skilled manual	20.09	19.39	20.79		20.94	20.61	21.28		0.85	*
	Unskilled manual	20.44	20.23	20.64		21.00	20.01	21.98		0.56	ns
	Other	20.65	19.64	21.66		*20.57*	19.21	21.92		-0.08	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03				**2012**				
					ns				***		
	Not working	19.38	19.20	19.57		20.57	20.40	20.74		1.18	***
	Agricultural	17.98	17.77	18.18		18.80	18.58	19.02		0.82	***
	Professional/technical/ managerial	24.04	23.64	24.45		24.39	24.12	24.66		0.35	ns
Indonesia	Clerical	24.68	24.05	25.32		25.16	24.55	25.77		0.47	ns
	Sales	18.83	18.58	19.09		20.28	20.07	20.49		1.45	***
	Services	19.63	19.20	20.07		20.39	20.03	20.74		0.75	**
	Skilled manual	19.58	19.15	20.00		19.78	19.56	20.00		0.20	ns
	Unskilled manual	s	s	s		19.86	19.23	20.49		-1.37	ns
	Other	s	s	s		s	s	s		5.16	*
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003				**2013**				
					**				***		
	Not working	21.64	21.46	21.82		21.85	21.66	22.04		0.21	ns
	Agricultural	19.41	19.02	19.80		19.90	19.60	20.20		0.49	*
	Professional/technical/ managerial	23.29	22.99	23.60		23.66	23.41	23.91		0.36	ns
Philippines	Clerical	24.23	23.69	24.77		23.99	23.53	24.45		-0.24	ns
	Sales	21.05	20.78	21.31		22.55	22.10	23.00		1.51	***
	Services	21.99	21.35	22.63		21.46	20.95	21.98		-0.53	ns
	Skilled manual	21.62	21.07	22.17		21.24	20.73	21.75		-0.38	ns
	Unskilled manual	20.58	20.12	21.04		21.21	20.96	21.45		0.63	*
	Other	s	s	s		s	s	s		-1.55	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

na indicates indicator is not available for the survey.

India DHS (NFHS-2 and NFHS-3) do not distinguish between skilled manual and unskilled manual.

Nepal and Pakistan DHS do not include a separate category for sales; women in these occupations are included in "other" occupations.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

In general, women who employed in professional or clerical occupations and, in some countries in sales occupations, marry at older ages than women who are not working. This is also true of women who work in sales in the Philippines and in other occupational categories in India, Nepal, and Indonesia. In all study

countries, women who work in agricultural occupations marry at younger ages than women who are not working. The pattern of older marriage age among professionals and younger marriage age among agricultural workers relative to unemployed women has been consistent at both survey points. However, women working in clerical positions did not marry at older ages in some countries at Survey 1 as they did at Survey 2.

Changes in marriage age over time have been widespread across most or all occupational categories in India and Nepal. In contrast, such changes have been clustered in two or three occupational groups in Pakistan, Cambodia, Indonesia, and the Philippines. Across all study countries and occupational categories where there have been significant changes in marriage age, marriage age has increased over time with one exception. Women working in clerical occupations in India married at an age that is one year younger in 2005-06 than did their counterparts in 1998-99 (p=0.003).

Marriage age has increased among women in all other occupational categories in India, except those working in services. The largest increases appear among women working in other occupations. In Nepal, marriage age increased in all occupational categories except skilled and unskilled manual labor. Women working in professional, clerical, services, or other occupational categories had average marriage ages that increased by 2 to 3.4 years between 2001 and 2011.

In Pakistan, significant increases in marriage age in the 6 years between surveys are restricted to two occupational groups and were larger among women working in service occupations (0.7 year, p=0.01) than among women who were not working (0.5 year, p=0.000). Although occupation is not associated with marriage age in Cambodia, marriage age increased between 2005 and 2014 among Cambodian women who are not working (1.4 years, p=0.022) and those working as skilled manual laborers (0.9 year, p=0.033). Marriage age increased over the decade between surveys among Indonesian women in sales (1.4 years, p=0.000), those who are not working (1.2 years, p=0.000), and those working in services (0.8 year, p=0.008). In the Philippines, increases in marriage age are restricted to women in sales (1.5 years, p=0.000) and in unskilled manual labor (0.6 year, p=0.019).

4.3. Marriage Age and Wealth

Household wealth quintile is significantly associated with marriage age in all seven study countries. Wealth has increased in salience with regard to marriage age over time in Cambodia, the only country in which wealth had not been significantly associated with marriage age at Survey 1. As seen in Table 9, wealth has a consistently positive association with marriage age in South Asian and Southeast Asian countries alike: marriage age rises monotonically with wealth in most countries. In Cambodia, however, marriage increase appears to decline slightly over the first two or three wealth quintiles before increasing among the richer and richest wealth quintiles, although these differences are small.

Table 9. Mean age at first marriage among ever-married women age 25-49, by household wealth quintile

Country	Wealth	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
South Asia											
			2004				**2014**				
					***				***		
Bangladesh	Poorest	14.83	14.65	15.01		15.39	15.20	15.57		0.56	***
	Poorer	14.74	14.59	14.88		15.65	15.47	15.82		0.91	***
	Middle	14.99	14.82	15.17		15.82	15.67	15.97		0.83	***
	Richer	15.32	15.13	15.51		16.18	16.01	16.35		0.86	***
	Richest	16.49	16.21	16.77		17.78	17.55	18.01		1.29	***
	Total	15.32	15.13	15.51		16.18	16.01	16.35		0.86	***
			1998-99				**2005-06**				
					***				***		
India	Poorest	16.13	16.05	16.21		16.43	16.34	16.51		0.30	***
	Poorer	16.30	16.22	16.37		16.66	16.58	16.74		0.37	***
	Middle	16.80	16.72	16.88		17.15	17.06	17.24		0.35	***
	Richer	17.75	17.66	17.84		18.07	17.98	18.17		0.32	***
	Richest	19.55	19.43	19.67		19.92	19.80	20.03		0.37	***
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.37	***
			2001				**2011**				
					***				***		
Nepal	Poorest	16.92	16.68	17.15		17.38	17.09	17.67		0.47	*
	Poorer	16.79	16.55	17.03		17.34	17.05	17.63		0.55	**
	Middle	16.90	16.63	17.17		17.35	17.07	17.63		0.45	*
	Richer	17.21	16.96	17.47		17.89	17.58	18.20		0.68	***
	Richest	17.93	17.65	18.21		19.35	19.11	19.59		1.43	***
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07				**2012-13**				
					***				***		
Pakistan	Poorest	18.07	17.76	18.38		18.14	17.78	18.51		0.07	ns
	Poorer	18.87	18.58	19.16		18.95	18.67	19.23		0.08	ns
	Middle	19.01	18.73	19.29		19.29	19.06	19.51		0.28	ns
	Richer	19.37	19.12	19.62		20.17	19.87	20.46		0.79	***
	Richest	20.44	20.16	20.73		21.43	21.20	21.67		0.99	***
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***

Continued

Table 9—*Continued*

Country	Wealth	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005		ns		**2014**		***		
Cambodia	Poorest	20.56	20.32	20.79		20.57	20.28	20.86		0.01	ns
	Poorer	20.40	20.18	20.62		20.28	20.03	20.52		-0.13	ns
	Middle	20.17	19.97	20.38		20.49	20.20	20.78		0.32	ns
	Richer	19.99	19.76	20.21		20.50	20.27	20.73		0.52	***
	Richest	20.52	20.29	20.76		21.31	21.11	21.51		0.78	***
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03		***		**2012**		***		
Indonesia	Poorest	18.56	18.32	18.79		19.33	19.12	19.54		0.78	***
	Poorer	18.22	18.00	18.44		19.63	19.44	19.82		1.41	***
	Middle	18.73	18.49	18.97		19.95	19.76	20.14		1.22	***
	Richer	19.32	19.07	19.56		20.76	20.55	20.97		1.44	***
	Richest	21.15	20.88	21.42		22.36	22.11	22.61		1.21	***
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003		***		**2013**		***		
Philippines	Poorest	19.97	19.70	20.23		19.94	19.71	20.17		-0.03	ns
	Poorer	20.97	20.74	21.19		21.13	20.90	21.36		0.16	ns
	Middle	21.55	21.32	21.79		21.72	21.48	21.95		0.16	ns
	Richer	22.42	22.15	22.68		22.89	22.64	23.13		0.47	**
	Richest	23.55	23.30	23.79		23.88	23.61	24.14		0.33	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

The largest inter-quintile differences occur between the richer and richest wealth quintiles in all countries, except the Philippines. In Indonesia, this difference grows with each successive quintile before doubling to 1.6 years difference between the richer and richest wealth quintiles in 2012. In Nepal, the mean age at marriage is almost identical among the poorest three wealth quintiles before increasing among the richer and richest wealth quintiles. The largest disparity (3.5 years, p=0.000) is observed in India; women in the poorest wealth quintile in 2005-06 married at an average age of 16.4 compared to age 19.9 among the women in the richest wealth quintile.

Mean age at marriage has increased over time in every wealth quintile in all South Asian countries except Pakistan, where there are significant increases seen only among women in the richer and richest quintiles. Marriage age has also increased among all wealth quintiles in Indonesia. However, significant increases are restricted to women in the richer wealth quintile in the Philippines and the richer and richest quintiles in Cambodia. The biggest increases occur among the richest wealth quintile in Nepal and among all but the poorest wealth quintile in Indonesia. Disparities in marriage age between women in the richest and poorest wealth quintiles have grown in all countries, most prominently in Nepal and Pakistan, where the gap is larger by almost 1 year at Survey 2 than at Survey 1.

4.4. Marriage Age and Religion

Table 10 shows that religion is significantly associated with marriage age in all three South Asian countries for which there is data and in Cambodia—but not the Philippines—in Southeast Asia[12]. Muslim women in Bangladesh and Nepal married at younger ages than did women of other religions, although in India they marry at similar ages as Hindu and Buddhist women. Hindu women married at younger ages than Christian, Sikh, and Jain women in India, Buddhist and Kirat women in Nepal, and women of "other" faiths in both countries. The differences among religious groups are smaller, but nonetheless significant in Cambodia. Here, Buddhist and Christian women marry at older ages than do Muslim women. While there is approximately four years that separate the average marriage age of Muslim women and the religious group with the oldest marriage age elsewhere, these groups are separated by less than a year in Cambodia.

Table 10. Mean age at first marriage among ever-married women age 25-49, by religion

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Religion	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
			2004				2014				
					***				***		
	Muslim	15.14	15.03	15.26		16.08	15.96	16.19		0.93	***
Bangladesh	Christian	***16.23***	***15.08***	***17.38***		***20.25***	***18.28***	***22.22***		4.02	*
	Buddhist	s	s	s		18.53	17.79	19.27		0.94	ns
	Hindu	16.45	16.04	16.86		17.04	16.70	17.39		0.59	*
	Total	15.32	15.13	15.51		16.18	16.01	16.35		0.86	***
			1998-99				2005-06				
					***				***		
	Muslim	16.96	16.84	17.08		17.31	17.17	17.45		0.34	***
	Christian	20.12	19.75	20.49		20.51	20.13	20.88		0.39	ns
India	Buddhist	17.29	16.63	17.95		17.38	16.88	17.89		0.09	ns
	Hindu	17.29	17.23	17.36		17.69	17.62	17.75		0.40	***
	Other	17.51	16.77	18.26		18.10	17.70	18.50		0.58	ns
	Sikh	20.00	19.75	20.24		19.80	19.56	20.03		-0.20	ns
	Jain	19.08	18.44	19.71		20.41	19.87	20.95		1.33	***
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.37	***
			2001				2011				
					***				***		
	Muslim	15.97	15.66	16.27		16.86	15.51	18.22		0.90	ns
Nepal	Buddhist	18.47	18.04	18.90		18.84	18.43	19.26		0.37	ns
	Hindu	17.02	16.87	17.17		17.84	17.65	18.02		0.81	***
	Other	20.03	19.18	20.88		20.60	19.80	21.41		0.57	ns
	Kirat	***16.96***	***16.00***	***17.93***		18.08	17.37	18.78		1.11	Ns
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***

Continued

[12] Data on religious affiliation are not available in DHS surveys for Pakistan and Indonesia.

Table 10—*Continued*

Country	Religion	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005		***		**2014**		***		
	Muslim	18.67	17.97	19.38		19.88	19.13	20.63		0.36	*
Cambodia	Christian	19.99	18.50	21.49		20.35	19.14	21.56		0.31	ns
	Buddhist	20.38	20.28	20.48		20.68	20.56	20.81		1.21	***
	Other	18.11	17.52	18.69		18.39	17.63	19.15		0.29	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2003		ns		**2013**		ns		
	Muslim	19.86	19.42	20.30		20.23	19.73	20.73		0.37	ns
	Other	21.71	21.15	22.26		21.67	21.24	22.11		-0.03	ns
Philippines	Roman Catholic	21.87	21.73	22.01		22.14	22.00	22.28		0.27	**
	Protestant	21.55	21.02	22.07		21.95	21.41	22.49		0.40	ns
	Iglesia Ni Kristo	21.62	21.06	22.17		22.27	21.64	22.90		0.66	ns
	Aglipay	22.18	21.37	22.99		22.02	20.68	23.36		-0.17	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

na indicates indicator is not available for the survey. No data on religion was collected in the Pakistan or Indonesia DHS.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

In contrast to other socio-demographic characteristics, marriage age has not increased consistently across religious groups in study countries. Rather, the trend toward older age at marriage is concentrated in selected groups. In Bangladesh, marriage age has increased from 2004 to 2014 among all religious groups (Muslims, Christians, and Hindus) except Buddhists. The most striking increase—of 4 years among Christian women—should be viewed with caution because of their small numbers in the sample. In contrast to Bangladesh, marriage age did increase significantly among Buddhist women in Cambodia (1.2 years, p=0.000). The marriage age increased among Muslim women in India and Cambodia. The mean age at marriage increased significantly among the Hindu majorities in India and Nepal, as well as among Jain and women of other faiths in India. In the Philippines, only Roman Catholics, the majority religious group, experienced an increase in the average age at marriage.

4.5. Marriage Age and Residence

In the bivariate analysis presented in Table 11, place of residence is associated with marriage age at both time points in all seven study countries (p=0.000). In South Asian and Southeast Asian countries alike, marriage age is higher on average among urban residents than among rural residents. The difference between these groups of women exceeds one year in Bangladesh, India, and Pakistan and approaches a year in Nepal and the Philippines. The largest difference occurs in Indonesia, where urban women married at 2.1 years older than their rural counterparts. Even in Cambodia, where the difference is the smallest, urban women married when they are nearly three-quarters of a year older than do rural women.

Table 11. Mean age at first marriage among ever-married women age 25-49, by place of residence

Country	Residence	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
South Asia											
			2004		***		**2014**		***		***
Bangladesh	Rural	15.07	14.94	15.20		15.88	15.77	15.99	15.88	0.81	***
	Urban	15.97	15.68	16.27		17.02	16.78	17.27	17.02	1.05	
	Total									0.00	
					***				***		
India	Rural	16.9	16.79	16.91		17.2	17.10	17.22			***
	Urban	18.7	18.61	18.88		19.0	18.85	19.09			0.018
	Total	17.39	17.32	17.46		17.76	17.70	17.82			***
			2001		***		**2011**		***		
Nepal	Rural	17.07	16.91	17.23		17.80	17.59	18.01		0.73	***
	Urban	17.92	17.47	18.38		18.75	18.41	19.09		0.83	**
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07		***		**2012-13**		***		
Pakistan	Rural	18.97	18.78	19.16		19.19	18.96	19.43		0.22	ns
	Urban	19.62	19.39	19.85		20.59	20.35	20.83		0.97	***
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***
Southeast Asia											
			2005		**		**2014**		***		
Cambodia	Rural	20.26	20.15	20.38		20.51	20.38	20.65		0.25	**
	Urban	20.70	20.44	20.96		21.28	21.08	21.49		0.58	***
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03		***		**2012**		***		
Indonesia	Rural	18.45	18.29	18.61		19.43	19.27	19.58		0.98	***
	Urban	20.12	19.87	20.37		21.50	21.29	21.71		1.38	***
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003		***		**2013**		***		
Philippines	Rural	21.06	20.88	21.25		21.55	21.37	21.73		0.48	***
	Urban	22.34	22.17	22.51		22.45	22.25	22.65		0.11	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

Age at marriage has increased among both rural and urban women in Bangladesh, India, Nepal, Cambodia, and Indonesia, with the largest increases observed among urban women in Bangladesh and Indonesia. However, age at marriage has risen only among urban women in Pakistan and only among rural women in the Philippines. Because marriage age is lower among rural women than urban women, this means that the disparity has narrowed over time in the Philippines but widened in Pakistan. The

rural-urban disparity has also widened in Bangladesh, Cambodia, and Indonesia and narrowed somewhat in India.

4.6. Marriage Age and Subnational Region

There are regional differences in marriage age in all seven countries, although this was not previously the case in Bangladesh and Indonesia. Age at marriage is higher than average in Sylhet and lower than average in Khulna, Rajshahi, and Rangpur[13] in Bangladesh. In India 2005-06, the most populous state pair, Uttar Pradesh and Uttaranchal[14], have an age at marriage close to the national average, with the state of Andhra Pradesh in the Southeast having the youngest marriage age (16.2 years) and Goa in the Southwest having the oldest (23 years). Other Southern states (e.g. Kerala, Karnataka, and Tamil Nadu) also have older ages at marriage, as do Manipur and Mizoram in the Northeast.

Table 12. Mean age at first marriage among ever-married women age 25-49, by subnational region

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Region	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
Bangladesh			**2004**				**2014**				
					ns				*		
	Dhaka	15.32	15.07	15.57		16.37	16.12	16.61		1.05	***
	Barisal	15.27	15.03	15.51		16.08	15.81	16.34		0.80	***
	Chittagong	15.87	15.51	16.24		16.70	16.42	16.99		0.83	***
	Khulna	14.91	14.69	15.14		15.68	15.48	15.88		0.77	***
	Rajshahi & Rangpur	14.79	14.61	14.97		15.57	15.43	15.71		0.78	***
	Sylhet	16.20	15.81	16.59		17.33	16.97	17.70		1.13	***
	Total	15.32	15.13	15.51		16.18	16.01	16.35		0.86	***
India			**1998-99**				**2005-06**				
					***				***		
	Uttar Pradesh & Uttaranchal	16.54	16.40	16.67		17.27	17.13	17.40		0.73	***
	Andhra Pradesh	18.86	18.39	19.34		16.22	16.03	16.40		-2.65	***
	Arunachal Pradesh	15.83	15.64	16.02		18.38	17.94	18.82		2.55	***
	Assam	18.39	18.09	18.68		19.00	18.61	19.40		0.62	*
	Bihar & Jharkhand	16.74	16.60	16.87		16.59	16.42	16.75		-0.15	ns
	Delhi	19.47	19.06	19.88		19.43	19.06	19.79		-0.05	ns
	Goa	22.08	21.60	22.56		22.99	22.56	23.42		0.91	**
	Gujarat	18.22	17.92	18.51		18.43	18.15	18.71		0.22	ns
	Haryana	18.21	17.96	18.47		17.87	17.60	18.15		-0.34	ns
	Himachal Pradesh	18.99	18.76	19.21		19.37	19.09	19.65		0.39	*
	Jammu & Kashmir	18.33	18.10	18.57		19.53	19.26	19.81		1.20	***
	Karnataka	17.48	17.15	17.82		18.29	17.99	18.59		0.81	***
	Kerala	20.29	19.93	20.65		20.85	20.46	21.24		0.56	*
	Madhya Pradesh	16.34	16.14	16.53		16.92	16.76	17.07		0.58	***
	Maharashtra	17.12	16.87	17.38		18.02	17.80	18.24		0.90	***
	Manipur	21.19	20.52	21.86		21.59	21.25	21.93		0.40	ns
	Meghalaya	19.24	18.83	19.64		19.92	19.60	20.25		0.69	**
	Mizoram	21.18	20.83	21.54		20.77	20.42	21.11		-0.42	ns
	Nagaland	20.05	19.64	20.46		19.97	19.70	20.24		-0.08	ns

Continued

[13] Although Rangpur and Rajshahi are now separate divisions, they were sampled as a single region in 2004. The two divisions are combined in 2014 so that regional trends between the two survey points can be compared.

[14] Although separate states in the 2005-06 DHS (NFHS-3), the state pairs of Uttar Pradesh and Uttaranchal, Madhya Pradesh and Chattisgarh, and Bihar and Jharkhand were sampled as single states in 1998-99 and are combined so that regional trends between the two survey points can be compared.

Table 12—*Continued*

Country	Region	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
	Orissa	17.66	17.45	17.87		18.08	17.83	18.33		0.42	*
	Punjab	20.01	19.82	20.20		19.42	19.17	19.67		-0.59	***
	Rajasthan	16.73	16.60	16.86		16.87	16.64	17.10		0.13	ns
	Sikkim	19.53	19.14	19.92		19.79	19.41	20.17		0.26	ns
	Tamil Nadu	18.80	18.54	19.05		19.17	18.93	19.40		0.37	*
	Tripura	18.52	18.10	18.94		18.57	18.10	19.05		0.05	ns
	West Bengal	17.34	17.11	17.58		17.57	17.33	17.81		0.23	ns
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.37	***
Nepal			**2001**		***		**2011**		***		
	Terai	16.66	16.44	16.88		17.64	17.34	17.94		0.98	***
	Mountain	17.57	17.17	17.97		17.69	17.41	17.96		0.12	ns
	Hill	17.69	17.47	17.92		18.36	18.12	18.60		0.67	***
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
Pakistan			**2006-07**		***		**2012-13**		***		
	Punjab	19.64	19.43	19.85		20.07	19.79	20.36		0.43	*
	Sindh	18.34	18.08	18.61		19.29	19.03	19.55		0.94	***
	Khyber Pakhtunkwa	18.62	18.30	18.94		19.07	18.72	19.42		0.45	ns
	Balochistan	19.38	18.98	19.77		18.53	18.15	18.91		-0.85	**
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***
Southeast Asia											
Cambodia			**2005**		***		**2014**		***		
	Phnom Penh	20.61	20.18	21.03		21.41	21.12	21.70		0.80	**
	Banteay Mean Chey	20.02	19.53	20.51		20.73	20.22	21.24		0.70	ns
	Kampong Cham	20.69	20.28	21.10		20.81	20.29	21.34		0.12	ns
	Kampong Chhnang	21.10	20.70	21.50		20.84	20.35	21.34		-0.25	ns
	Kampong Speu	19.88	19.64	20.13		20.30	19.78	20.81		0.41	ns
	Kampong Thom	20.47	19.94	20.99		20.73	20.32	21.14		0.26	ns
	Kandal	20.32	20.03	20.60		21.37	20.93	21.80		1.05	***
	Kratie	20.50	20.06	20.94		20.20	19.67	20.73		-0.31	ns
	Prey Veng	20.03	19.67	20.39		20.07	19.68	20.46		0.04	ns
	Pursat	19.83	19.43	20.24		20.74	19.89	21.60		0.91	ns
	Siem Reap	20.97	20.66	21.28		20.59	20.04	21.15		-0.37	ns
	Svay Rieng	20.09	19.68	20.50		20.27	19.79	20.75		0.18	ns
	Takeo	20.41	20.09	20.74		20.63	20.24	21.01		0.21	ns
	Otdar Mean Chey	19.60	19.31	19.89		20.05	19.62	20.48		0.45	ns
	Battambang & Pailin	20.16	19.68	20.64		20.86	20.33	21.39		0.70	ns
	Kampot & Kep	20.09	19.72	20.47		20.06	19.64	20.47		-0.04	ns
	Preah Sihanouk & Kaoh Kong	20.32	19.73	20.92		20.35	20.03	20.68		0.03	ns
	Preah Vihear & Steung Treng	19.40	19.05	19.75		19.93	19.45	20.42		0.54	ns
	Mondol Kiri & Rattanak Kiri	18.72	18.20	19.24		19.46	18.88	20.04		0.74	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***

Continued

Table 12—*Continued*

Country	Region	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Indonesia			**2002-03**				**2012**				
					ns				***		
	Sumatera	20.00	19.76	20.24		20.93	20.77	21.08		0.93	***
	Java	18.81	18.61	19.02		20.33	20.12	20.55		1.52	***
	Bali & Tenggara	20.31	20.04	20.58		21.13	20.82	21.44		0.82	***
	Kalimantan	19.13	18.86	19.41		19.86	19.59	20.13		0.73	***
	Sulawesi, Maluku & Papua	20.02	19.76	20.28		20.54	20.34	20.75		0.52	**
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
Philippines			**2003**				**2013**				
		7,377			***	8,290			***		
	National Capital	22.74	22.42	23.06		22.54	22.15	22.93		-0.20	ns
	Cordillera	21.37	20.60	22.14		22.44	21.86	23.01		1.07	*
	I - Ilocos	22.33	21.65	23.02		22.79	22.35	23.23		0.46	ns
	II - Cagayan Valley	21.45	20.86	22.04		21.06	20.48	21.63		-0.39	ns
	III - Central Luzon	21.88	21.47	22.29		22.18	21.79	22.57		0.30	ns
	IVA - Calabarzon	22.26	21.89	22.62		22.83	22.40	23.26		0.57	ns
	IVB - Mimaropa	20.89	20.26	21.53		20.69	20.03	21.36		-0.20	ns
	V - Bicol	21.41	20.93	21.89		21.94	21.41	22.46		0.53	ns
	VI - Western Visayas	22.00	21.48	22.52		22.25	21.80	22.71		0.26	ns
	VII - Central Visayas	21.68	21.23	22.13		22.60	22.05	23.15		0.92	*
	VIII - Eastern Visayas	20.67	20.10	21.25		21.70	21.09	22.31		1.03	*
	IX - Zamboanga Peninsula	21.16	20.55	21.76		20.84	20.38	21.29		-0.32	ns
	X - Northern Mindanao	21.60	21.05	22.14		21.33	20.52	22.15		-0.26	ns
	XI - Davao	21.32	20.82	21.82		21.46	20.88	22.04		0.14	ns
	XII - Soccskargen	20.90	20.10	21.69		20.85	20.20	21.49		-0.05	ns
	XIII - Caraga	21.01	20.50	21.52		21.25	20.60	21.90		0.24	ns
	ARMM	19.95	19.43	20.46		20.08	19.65	20.50		0.13	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

In Nepal, women in the hill region have an older marriage age; women in the terai and mountain region tend to marry at similar ages. In Pakistan, the age at marriage ranges from 18.5 years in Balochistan to 20.1 years in Punjab. Marriage age in Phnom Penh is the highest in Cambodia, about 0.8 year higher than the national average. Marriage age exceeds 20 years of age in all regions except Preah Vihear and Steung Treng (19.9 years) and Mondol Kiri and Rattanak Kiri (19.5 years). Indonesia and the Philippines exhibit a similar pattern of generally high ages at marriage across regions. Marriage age ranges from 19.9 years in Kalimantan to 21.1 years in Bali and Tenggara in Indonesia, and from 20.1 years in the Autonomous Region in Muslim Mindanao (ARMM) to 22.8 years in Calabarzon in the Philippines.

However, there has been little change in marriage over time in most regions in the Philippines and Cambodia. In contrast, Indonesia has seen shifts in marriage age across all regions. Similarly, increases in marriage age have been more regionally widespread in Bangladesh, Nepal, and Pakistan. India presents more mixed trends. Significant increases in marriage age have occurred since 1998-99 in approximately half of the states. The largest increase (2.6 years, p=0.000) is observed in Arunachal Pradesh. Countering the broad trend toward higher age at marriage, there is a significant—and sizable—decline in the age at

marriage in Andhra Pradesh (-2.7 years, p=0.000) and by a lesser margin in the Indian state of Punjab (-0.6 year, p=0.000). Marriage age also declined in Balochistan, Pakistan (-0.85 years, p=0.003).

4.7. Marriage Age and Husbands' Education and Occupation

Two variables that describe husbands' characteristics—education and occupation—and may be related to marriage age or the first birth interval are presented in this section. Data on marriage age according to husbands' education is presented in Table 13 and on the husbands' occupation in Table 14.

4.7.1. Husband's education

Husband's education is significantly associated with marriage age in all seven study countries at a significance level of p=0.000, although in Cambodia, the association only became detectable in the most recent survey (2014). As with women's own education, marriage age exhibits the same monotonic increase with increasing levels of husband's education, except in Cambodia. Here, as was found with women's education, marriage age first declines slightly among women married to husbands with primary education as compared to no education, and then rises with increasing levels of husband's education.

Table 13. Mean age at first marriage among ever-married women age 25-49, by husband's education

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Education	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
			2004				**2014**				
					***				***		
	No education	14.64	14.53	14.76		15.27	15.13	15.41		0.62	***
	Primary	15.04	14.89	15.18		15.80	15.64	15.96		0.76	***
Bangladesh	Secondary	15.46	15.30	15.63		16.34	16.19	16.49		0.88	***
	Higher	17.92	17.50	18.35		18.91	18.65	19.18		0.99	***
	Don't know	na	na	na		na	na	na		--	--
	Total	15.32	15.13	15.51		16.18	16.01	16.35		0.86	***
			1998-99				**2005-06**				
					***				***		
	No education	16.12	16.06	16.17		16.42	16.35	16.49		0.30	***
	Primary	16.72	16.65	16.80		16.92	16.84	17.01		0.20	***
India	Secondary	17.71	17.64	17.78		18.13	18.06	18.20		0.42	***
	Higher	19.68	19.56	19.81		20.78	20.63	20.92		1.09	***
	Don't know	na	na	na		17.28	16.95	17.62		--	--
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.37	***
			2001				**2011**				
					***				***		
	No education	16.69	16.49	16.89		16.84	16.57	17.11		0.15	ns
	Primary	17.21	17.02	17.41		17.37	17.14	17.60		0.16	ns
Nepal	Secondary	17.50	17.29	17.72		18.19	17.99	18.38		0.68	***
	Higher	18.61	18.25	18.97		20.45	20.03	20.87		1.84	***
	Don't know	16.58	16.09	17.07		*17.43*	*16.17*	*18.68*		0.85	ns
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07				**2012-13**				
					***				***		
	No education	18.38	18.17	18.58		18.64	18.40	18.88		0.26	ns
	Primary	18.81	18.52	19.10		19.07	18.80	19.35		0.26	ns
Pakistan	Secondary	19.73	19.49	19.97		20.01	19.78	20.24		0.28	ns
	Higher	20.48	20.20	20.76		21.56	21.27	21.84		1.08	***
	Don't know	s	s	s		***21.79***	***19.56***	***24.02***		2.40	ns
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***

Continued

Table 13—*Continued*

Country	Education	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005				**2014**				
					ns				***		
Cambodia	No education	20.57	20.30	20.85		20.49	20.15	20.83		-0.08	ns
	Primary	20.15	19.99	20.31		20.26	20.07	20.45		0.10	ns
	Secondary	20.36	20.19	20.53		20.81	20.65	20.97		0.45	***
	Higher	21.57	20.95	22.19		22.80	22.43	23.18		1.23	***
	Don't know	20.84	20.17	21.50		21.86	20.21	23.51		1.02	ns
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03				**2012**				
					***				***		
Indonesia	No education	17.47	17.09	17.85		18.26	17.64	18.89		0.79	*
	Primary	17.87	17.73	18.00		18.62	18.48	18.76		0.75	***
	Secondary	20.62	20.47	20.77		21.37	21.23	21.50		0.75	***
	Higher	23.35	22.99	23.71		24.10	23.86	24.33		0.75	***
	Don't know	18.70	17.64	19.75		19.67	18.31	21.04		0.98	ns
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003				**2013**				
					***				***		
Philippines	No education	19.56	18.86	20.27		18.68	17.92	19.44		-0.88	ns
	Primary	20.16	19.97	20.35		20.18	19.97	20.38		0.02	ns
	Secondary	21.77	21.57	21.96		21.89	21.72	22.06		0.12	ns
	Higher	23.62	23.42	23.82		23.86	23.66	24.06		0.24	ns
	Don't know	s	s	s		s	s	s		-3.96	ns
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

na indicates indicator is not available for the survey.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

The disparity in marriage age between those married to men with the least education and with the most education ranges from a difference of 2.3 years in Cambodia to 5.8 years in Indonesia. The education disparity in South Asian countries ranges from 2.9 years (Pakistan) to 3.6 years (Bangladesh). Women who do not know their husband's level of education tend to have married at ages in the middle of the range between those married to men with the no education and higher education.

Marriage age has increased over time among all categories of husband's education in Bangladesh, India, and Indonesia. However, later marriage age is concentrated only among secondary and higher education groups in Nepal and Cambodia and the higher education group only in Pakistan. The largest increase occurred among women married to men with higher education in Nepal (1.8 years increase from 2001 to 2011, p=0.000). Even among countries in which the marriage age increased across all educational groups, they did so at different rates, so that the disparity by husband's education has widened in all four South Asian countries and in Cambodia and the Philippines. Only in Indonesia has the disparity remained steady, although it is the largest among the study countries.

4.7.2 Husband's occupation

Husband's occupation is significantly associated with marriage age, although somewhat less strongly so, in 6 of 7 study countries. There is no detectable association in Nepal in 2011, though there had been one in 2001. There had been no detectable association between husband's occupation and marriage age in Survey 1 in Bangladesh or Indonesia. As with women's own occupation, women married to men in professional occupations tend to have married at older ages and those married to men in agricultural occupations at younger ages. Women whose husbands are in clerical and sales occupations often tend to marry at older ages and those married to husbands in unskilled manual labor at younger ages, although these differentials usually are not as large.

Table 14. Mean age at first marriage among ever-married women age 25-49, by husband's occupation

		Survey 1				Survey 2				Difference survey 1-survey 2	
Country	Occupation	Mean	CI		p-value[1]	Mean	CI		p-value[1]		p-value[2]
South Asia											
			1998-99				2005-06				
					ns				*		
	Agricultural	16.54	16.48	16.60		16.85	16.77	16.92		0.30	***
	Professional/technical/ managerial	19.51	19.35	19.67		20.25	20.09	20.42		0.75	***
India	Clerical	19.15	18.94	19.35		19.21	19.00	19.41		0.06	ns
	Sales	18.24	18.11	18.36		18.67	18.54	18.79		0.43	***
	Services	18.01	17.85	18.18		18.02	17.87	18.18		0.01	ns
	Skilled/unskilled manual	17.32	17.24	17.40		17.53	17.46	17.61		0.21	***
	Other	17.88	17.53	18.23		17.21	16.72	17.70		-0.67	*
	Not working	17.06	16.86	17.26		17.40	17.12	17.67		0.34	*
	Total	17.39	17.32	17.46		17.76	17.70	17.82		0.37	***
			2001				2011				
					**				ns		
	Agricultural	16.94	16.76	17.13		17.55	17.32	17.79		0.61	***
	Professional/technical/ managerial	17.92	17.57	18.28		19.71	19.30	20.12		1.79	***
Nepal	Clerical	17.11	16.85	17.38		17.80	17.32	18.28		0.68	*
	Services	17.86	17.40	18.31		18.44	18.22	18.66		0.59	*
	Skilled manual	17.30	16.94	17.67		17.33	17.06	17.61		0.03	ns
	Unskilled manual	17.15	16.87	17.44		17.29	17.03	17.55		0.14	ns
	Other	17.45	17.11	17.79		18.55	17.67	19.42		1.10	*
	Not working	na	na	na		na	na	na		--	--
	Total	17.16	16.99	17.32		17.93	17.73	18.14		0.78	***
			2006-07				2012-13				
					*				*		
	Agricultural	18.83	18.54	19.12		18.93	18.50	19.37		0.10	ns
	Professional/technical/ managerial	20.33	19.94	20.73		21.08	20.69	21.48		0.75	**
	Clerical	19.22	18.67	19.77		20.73	20.01	21.45		1.51	***
Pakistan	Sales	19.41	19.10	19.72		20.47	20.18	20.77		1.06	***
	Services	19.17	18.78	19.57		19.93	19.59	20.28		0.76	**
	Skilled manual	19.36	19.06	19.65		19.98	19.66	20.29		0.62	**
	Unskilled manual	18.96	18.72	19.20		19.07	18.82	19.31		0.11	ns
	Other	s	s	s		s	s	s		--	--
	Not working	18.53	17.91	19.15		19.19	18.50	19.88		0.66	ns
	Total	19.20	19.05	19.35		19.69	19.49	19.89		0.49	***

Continued

Table 14—*Continued*

Country	Occupation	Survey 1 Mean	Survey 1 CI		Survey 1 p-value[1]	Survey 2 Mean	Survey 2 CI		Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia											
			2005		*		**2014**		*		
	Agricultural	20.26	20.12	20.40		20.28	20.11	20.46		0.02	ns
	Professional/technical/ managerial	20.65	20.29	21.00		21.47	21.13	21.82		0.83	***
	Clerical	20.95	20.32	21.58		21.57	20.65	22.50		0.62	ns
Cambodia	Sales	20.36	19.96	20.77		20.91	20.46	21.36		0.55	ns
	Services	20.42	20.05	20.78		20.69	20.37	21.02		0.27	ns
	Skilled manual	20.40	20.13	20.68		20.88	20.65	21.11		0.48	**
	Unskilled manual	20.47	20.08	20.85		21.21	19.94	22.47		0.74	ns
	Other	19.52	18.91	20.14		21.23	20.20	22.25		1.71	**
	Not working	na	na	na		na	na	na		--	--
	Total	20.33	20.22	20.44		20.64	20.52	20.77		0.31	***
			2002-03		ns		**2012**		*		
	Agricultural	18.08	17.91	18.24		19.09	18.91	19.28		1.02	***
	Professional/technical/ managerial	21.51	21.15	21.87		22.97	22.70	23.25		1.47	***
	Clerical	21.67	21.31	22.03		23.24	22.86	23.62		1.57	***
Indonesia	Sales	19.80	19.50	20.10		20.67	20.38	20.96		0.87	***
	Services	19.60	19.34	19.85		20.79	20.48	21.10		1.19	***
	Skilled manual	19.70	19.34	20.05		20.21	20.04	20.38		0.51	*
	Unskilled manual	19.12	18.83	19.42		22.36	21.77	22.96		3.24	*
	Other	*20.64*	*18.20*	*23.08*		*21.44*	*19.27*	*23.60*		0.79	ns
	Not working	18.55	18.05	19.04		19.73	19.15	20.31		1.18	**
	Total	19.24	19.08	19.39		20.49	20.34	20.64		1.25	***
			2003		***		**2013**		***		
	Agricultural	20.47	20.25	20.68		20.40	20.21	20.59		-0.07	ns
	Professional/technical/ managerial	23.29	22.98	23.60		23.66	23.34	23.98		0.37	ns
	Clerical	22.97	22.21	23.73		23.40	22.80	24.01		0.43	ns
Philippines	Sales	21.97	21.54	22.41		22.96	22.18	23.75		0.99	*
	Services	22.61	22.11	23.10		23.13	22.68	23.58		0.52	ns
	Skilled manual	21.45	21.15	21.74		22.21	22.00	22.42		0.76	***
	Unskilled manual	21.99	21.76	22.22		21.80	21.53	22.07		-0.19	ns
	Other	22.68	21.97	23.40		22.74	21.99	23.49		0.06	ns
	Not working	na	na	na		na	na	na		--	--
	Total	21.76	21.63	21.89		22.00	21.86	22.14		0.24	*

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] p-value of association test within each year.

[2] p-value of significance test for the difference in means between surveys.

na indicates indicator is not available for the survey.

Indonesia, Cambodia, and Philippines DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India DHS (NFHS) and Indonesia DHS captures husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

India DHS (NFHS) do not distinguish between skilled manual and unskilled manual.

Nepal and Pakistan DHS do not include a separate category for sales; women in these occupations are included in "other" occupations.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

The differential between women married to men in professional and agricultural occupations—the categories with the youngest and oldest age at marriage—exhibit no clear pattern across South and Southeast Asian countries. The disparity exceeds 3 years in India, Indonesia, and the Philippines but ranges between 1.2 and 2.2 in Nepal, Pakistan, and Cambodia. This disparity, however, has widened over time among all countries.

Age at marriage has increased among women married to men in most occupational groups in South Asian countries and Indonesia. Where increases in marriage age have been widespread in South Asia, they have nonetheless not occurred among women married to men in agricultural and unskilled labor positions. Indonesia has seen increasing marriage age in these and all other occupational groups, with the exception of husbands employed in "other" occupations.

In contrast to this widespread delay in marriage, increases in marriage age are concentrated in just a few occupation groups in Cambodia and the Philippines. Compared to a decade earlier, marriage occurs later for Cambodian women married to men in professional occupations and those who are not working, and for Indonesian women married to husbands in sales and skilled manual labor occupations.

5. Characteristics Associated with the First Birth Interval

In a similar format to the tables in the previous section, Table 15 demonstrates the overall change in the mean duration of the first birth interval. Tables 16-26 display the distribution across background characteristics of the duration of the first birth interval among ever-married women age 20-49 and the results of tests of significance of the association between each background characteristic and the first birth interval. The duration of the first birth interval is measured in months and calculated as the extended mean, an exponential extension of the survival curve, to account for right hand censoring of some observations. These tables show the means and associations with background characteristics at two time points for each study country and the negative difference (shortened first birth interval) or positive (lengthened first birth interval) for each background characteristic and results testing the statistical significance of that change. Associations are tested with a Tarone-Ware test of equality of the survival curve.

Table 16 shows that the change in the first birth interval between Survey 1 and Survey 2 is statistically significant in six of seven study countries; Cambodia is the exception (p=0.343). However, the direction of the change is not consistent across countries or within regions. While age at marriage increased in all study countries, the first birth interval became shorter in four countries: Bangladesh, Nepal, Pakistan, and Indonesia. The amount of the decrease between surveys ranges from 0.5 months shorter (Indonesia, p=0.001) to 6.5 months shorter (Bangladesh, p=0.000). In India and the Philippines, the first birth interval lengthened with increasing ages at marriage by 0.6 months (p=0.000) and 2.8 months (p=0.001), respectively.

Table 15. Change in the mean[1] marriage to first birth interval (in months) among ever-married women age 25-49

Country	Survey 1 Mean	Survey 2 Mean	Difference survey 1-survey 2	p-value[2]
South Asia				
Bangladesh	**2004** 44.76	**2014** 38.29	-6.47	***
India	**1998-99** 39.53	**2005-06** 40.13	0.60	***
Nepal	**2001** 44.57	**2011** 39.08	-5.49	***
Pakistan	**2006-07** 45.25	**2012-13** 44.12	-1.13	***
Southeast Asia				
Cambodia	**2005** 33.02	**2014** 31.91	-1.11	ns
Indonesia	**2002-03** 34.58	**2012** 34.04	-0.54	***
Philippines	**2003** 27.82	**2013** 30.61	2.78	***

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

5.1. First Birth Interval and Gender Context

This study uses the same three variables to describe the gender context and its possible association with the first birth interval: the number of decisions in which women are involved, attitudes toward wife beating, and spousal age difference. The mean first birth interval according to each of these variables, respectively, are found in Tables 16-18. India and Pakistan surveys did not collect data on women's decision-making and wife beating attitudes at Survey 1 and, in Bangladesh, neither survey collected data on wife beating attitudes; thus, change in the first birth interval according to these characteristics cannot be assessed for these countries.

5.1.1. Decision-making

At the most recent survey, the number of decisions in which women participate is significantly associated with the first birth interval in all four South Asian countries in the study and in Cambodia, but neither in Indonesia nor the Philippines. As shown in Table 16, the association (and lack of association) in Survey 2 remains unchanged from Survey 1.

Table 16. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by women's decision-making

		Survey 1		Survey 2		Difference survey 1-survey 2	
Country	Number of decisions	Mean	p-value[2]	Mean	p-value[2]		p-value[3]
South Asia							
		2004	**	**2014**	*		
	0	48.99		36.67		-12.31	***
Bangladesh	1	45.72		37.84		-7.88	***
	2	41.87		34.79		-7.09	***
	3	43.26		36.74		-6.52	***
	Total	44.76		38.29		-6.47	***
					***		
	0	na		37.92		--	--
India	1	na		37.39		--	--
	2	na		37.60		--	--
	3	na		35.79		--	--
	Total	39.53		40.13		0.60	***
		2001	***	**2011**	***		
	0	47.80		40.82		-6.98	***
Nepal	1	42.08		38.65		-3.43	***
	2	39.01		36.17		-2.84	*
	3	43.17		35.72		-7.45	***
	Total	44.57		39.08		-5.49	***
		2006-07		**2012-13**	***		
	0	na		48.15		--	--
Pakistan	1	na		37.92		--	--
	2	na		36.63		--	--
	3	na		38.24		--	--
	Total	45.25		44.12		-1.13	***

Continued

Table 16—*Continued*

Country	Number of decisions	Survey 1 Mean	Survey 1 p-value[1]	Survey 2 Mean	Survey 2 p-value[1]	Difference survey 1-survey 2	p-value[2]
Southeast Asia							
		2005		**2014**			
			*		*		
	0	s	[4]	40.40			
Cambodia	1	22.09	[4]	27.76		5.68	**
	2	29.32		30.66		1.34	ns
	3	33.18		29.51		-3.67	ns
	Total	33.02		31.91		-1.11	ns
		2002-03		**2012**			
			ns		ns		
	0	36.16		30.57		-5.59	ns
Indonesia	1	35.71		29.30		-6.41	ns
	2	34.83		30.76		-4.07	ns
	3	34.14		32.41		-1.73	***
	Total	34.58		34.04		-0.54	***
		2003		**2013**			
			ns		ns		
	0	30.57		*26.58*	[4]	-3.99	ns
Philippines	1	24.00	[4]	33.25		9.26	ns
	2	31.18		26.25		-4.93	ns
	3	31.78		33.96		2.18	ns
	4	26.62		29.07		2.46	**
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

No data on women's decision-making were collected in the 1998-99 India DHS (NFHS-2) nor the 2006-07 Pakistan DHS.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

Although marriage age rose with greater decision-making, in general, women with greater decision-making capacity have shorter first birth intervals. However, this relationship is not monotonic. In several countries, the first birth interval lengthens among women participating in the most decisions. The largest differences by decision-making capacity are found in Cambodia, where women who participate in one decision have first birth intervals that are, on average, 12.5 months shorter than women who participate in no decisions (p=0.012). The differences are smallest in India where women who participate in all three listed decisions have first birth intervals that are only about 2 months shorter than do those who make no decisions (p=0.000).

In both South Asian countries in which trends can be assessed—Bangladesh and Nepal—the first birth interval has become shorter across all levels of decision-making over the decade between surveys. The decrease is most substantial among women making no decisions. Among these women, the first birth has become shorter by one year in Bangladesh (p=0.000) and 7 months in Nepal (p=0.000).

In contrast, change in Southeast Asia in the first birth interval has not been widespread across women of different decision-making capacity. In Cambodia, the first birth interval appears to have lengthened over

time for most women; however, this change is only statistically significant among women who make 1 decision (6 months, p=0.003). The first birth interval has shortened by close to 2 months for women making 3 decisions in Indonesia (p=0.000) and increased by 2.5 months among women making 4 decisions in the Philippines (p=0.005).

In Bangladesh and Nepal, the first birth interval has changed between surveys in such a way that the disparity across decision-making has narrowed by roughly 4 months. This same narrowing of the disparity in mean duration of the first birth interval according to level of decision-making is not seen in the Southeast Asian countries in the study.

5.1.2 Attitudes toward wife beating

Although attitudes toward wife beating are significantly associated with marriage age (except in Nepal), wife beating attitudes are generally not associated with the first birth interval. Only two countries—Pakistan and Indonesia—show such an association at the most recent survey; none did at Survey 1[15]. The first birth interval is significantly longer among women who think wife beating is not acceptable in any of the scenarios described (44.7 months versus 42.5 months, p=0.000) in Pakistan, but in Indonesia, they are slightly shorter among these women (33.8 months versus 34.1 months, p=0.001).

Table 17. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by attitudes toward wife beating

		Survey 1		Survey 2		Difference survey 1-survey 2	
Country	Wife beating attitudes	Mean	p-value[2]	Mean	p-value[2]		p-value[3]
South Asia							
		1998-99		**2005-06**			
					ns		
India	Acceptable in at least one scenario	na		39.47		--	--
	Rejects in all scenarios	na		40.16		--	--
	Total	39.53		40.13		0.60	***
		2001		**2011**			
			ns		ns		
Nepal	Acceptable in at least one scenario	42.80		*37.35*	[4]	-5.45	ns
	Rejects in all scenarios	44.75		39.06		-5.68	***
	Total	44.57		39.08		-5.49	***

Continued

[15] Wife beating attitudes were not assessed at Survey 1 in Pakistan and India.

Table 17—*Continued*

Country	Wife beating attitudes	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
		2006-07		**2012-13**			
					***		
Pakistan	Acceptable in at least one scenario	na		42.48		--	--
	Rejects in all scenarios	na		44.74		--	--
	Total	45.25		44.12		-1.13	***
Southeast Asia							
		2005		**2014**			
			ns		ns		
Cambodia	Acceptable in at least one scenario	31.89		31.92		0.03	ns
	Rejects in all scenarios	30.73		31.46		0.73	ns
	Total	33.02		31.91		-1.11	ns
		2002-03		**2012**			
			ns		***		
Indonesia	Acceptable in at least one scenario	34.32		34.07		-0.25	ns
	Rejects in all scenarios	34.62		33.84		-0.77	***
	Total	34.58		34.04		-0.54	***
		2003		**2013**			
			ns		ns		
Philippines	Acceptable in at least one scenario	27.29		24.41		-2.89	*
	Rejects in all scenarios	27.91		31.87		3.96	**
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

No data on attitudes toward wife beating were collected in the 1998-99 India DHS (NFHS-2) nor the 2006-07 Pakistan DHS. In the Nepal 2011 survey, but not the 2001 survey, a filter question was inserted and respondents answering "no" when asked, "In your opinion, should a husband hit or beat his wife for any reason at all?" were not asked if wife beating was justified in specific scenarios. This questionnaire change may result in a measurement change (decrease) in the prevalence of attitudes accepting of wife beating as well as in detecting any associations with this variable.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

Change in the first birth interval has been isolated only to women who reject wife beating in Nepal and Indonesia, among whom the first birth interval shortened by 5.7 months and 0.8 months, respectively (p=0.000). In the Philippines, the first birth interval lengthened among women who reject wife beating (4 months, p=0.007) and shortened among women who accept wife beating (2.9 months, p=0.030). With the shortening of the first birth interval limited to women rejecting wife beating in Nepal and Indonesia and changing in divergent directions in the Philippines, the disparity in the first birth interval has widened over time in these countries, although these differences are nonetheless not statistically significant in Nepal and the Philippines.

5.1.3. Spousal age difference

Table 18 indicates that spousal age difference is strongly associated with the first birth interval in all seven study countries, and has remained so at both survey points. This pattern resembles the pattern found with marriage age.

Table 18. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by spousal age difference

Country	Spousal age difference	Survey 1		Survey 2		Difference survey 1-survey 2	p-value[3]
		Mean	p-value[2]	Mean	p-value[2]		
South Asia							
		2004	***	**2014**	***		
Bangladesh	0-2 years	51.82		40.31		-11.51	*
	3-5 years	43.37		36.93		-6.44	***
	6-10 years	38.17		34.07		-4.10	***
	More than 10 years	42.53		38.10		-4.43	***
	Total	44.76		38.29		-6.47	***
		1998-99	***	**2005-06**	***		
India	0-2 years	37.15		36.57		-0.57	ns
	3-5 years	36.58		35.59		-0.99	ns
	6-10 years	33.50		36.86		3.36	***
	More than 10 years	41.58		40.21		-1.38	ns
	Total	39.53		40.13		0.60	***
		2001	*	**2011**	**		
Nepal	0-2 years	39.67		36.15		-3.52	***
	3-5 years	44.07		34.45		-9.62	***
	6-10 years	42.70		36.57		-6.13	***
	More than 10 years	46.23		51.73		5.51	ns
	Total	44.57		39.08		-5.49	***
		2006-07	*	**2012-13**	**		
Pakistan	0-2 years	42.03		42.18		0.15	**
	3-5 years	41.65		40.21		-1.43	***
	6-10 years	43.20		40.23		-2.97	**
	More than 10 years	43.16		45.81		2.65	ns
	Total	45.25		44.12		-1.13	***

Continued

Table 18—*Continued*

Country	Spousal age difference	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
Southeast Asia							
		2005		**2014**			
			***		*		
	0-2 years	29.35		29.25		-0.10	ns
Cambodia	3-5 years	27.03		28.33		1.29	ns
	6-10 years	30.36		29.55		-0.81	ns
	More than 10 years	49.10		38.68		-10.42	ns
	Total	33.02		31.91		-1.11	ns
		2002-03		**2012**			
			***		***		
	0-2 years	32.02		31.40		-0.62	ns
Indonesia	3-5 years	30.89		29.74		-1.15	ns
	6-10 years	31.10		30.28		-0.82	**
	More than 10 years	40.91		43.98		3.08	ns
	Total	34.58		34.04		-0.54	***
		2003		**2013**			
			***		***		
	0-2 years	25.70		30.59		4.89	ns
Philippines	3-5 years	23.70		25.67		1.97	***
	6-10 years	27.49		31.60		4.11	ns
	More than 10 years	33.92		33.77		-0.15	ns
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

The general pattern is one of initially decreasing first birth intervals as the spousal age gap increases, before it lengthens again among those with even greater spousal age gaps. In most countries, the shortest first birth interval is among women with 3-5 years age difference with their husbands. In Bangladesh, however, it is women with a 6-10 year age difference who have the shortest birth interval. Here, the longest first birth interval appears among women with 0-2 years age difference with their husbands; this pattern is observed in both Survey 1 and 2. In all other countries, the longest birth interval appears among women with more than 10 years age difference.

The largest disparity by spousal age gap in the length of the first birth interval (17.3 months) is observed in Nepal, followed by Indonesia and Cambodia. In contrast, 4.6 months separates the first birth interval of women with more than 10 years age difference and women with 3-5 years age difference.

Change in the first birth interval has been widespread in Bangladesh, where all groups of women have experienced a shortened birth interval, and in Nepal and Pakistan, where the birth interval has changed for all but women with the largest spousal age difference. Pakistani women who are closest in age to their husbands (0-2 years difference) in Survey 2 experienced a very slight increase in the first birth interval

compared to their counterparts in Survey 1 (0.15 months, p=0.010). Meanwhile, women in other age groups experienced a shortening of the birth interval.

In India, the first birth interval changed only for women with the 6-10 age difference with their spouse. These women experienced a first birth interval that was 3.4 months longer at Survey 2 than among their counterparts at Survey 1 (p≤0.001). Change in the first birth interval is similarly limited to a single group of women in Indonesia and the Philippines. The first birth interval shortened by less than a month for Indonesian women with 6-10 spousal age difference (p=0.010), whereas it lengthened by 2 months among Philippine women with 3-5 years age difference (p=0.001). These data highlight that direction and rates of change have not been consistent across age groups outside of Bangladesh, Nepal, and Pakistan.

The pattern—of shorter first birth intervals among those with 3-5 years age difference and longer among those with more than 10 years difference—has been consistent at both surveys. The disparity across groups of spousal age difference has declined over time in four study countries, most dramatically in Cambodia (from about 22.1 months separating those with the longest and shortest first birth interval to about 10.4 months,) and Bangladesh (from about 13.6 to 6.2 months difference) but also in India and the Philippines. However, this disparity has increased somewhat (from 10 months to 14.2 months) in Indonesia and more than doubled in Nepal (6.6 months to 17.3 months) and Pakistan (1.5 months to 5.6 months).

5.2. First Birth Interval and Education and Occupation

5.2.1. Education

The first birth interval differs significantly by women's education in all seven study countries. In all countries but Cambodia, this association was observed in Survey 1 as well. There is a negative relationship between education and the first birth interval, although the birth interval is not always monotonically shorter among women with increasing levels of education. In Bangladesh, the first birth interval decreases substantially between women with no education and those with primary education before increasing somewhat with increasing levels of education. The largest differential in the first birth interval by educational level is in Indonesia, where 18 months separates women with no education from women with secondary education. Differentials are also sizable—in excess of 10 months—in Pakistan (14 months), Nepal (11 months), and the Philippines (11.5 months).

Table 19. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by level of education

Country	Education	Survey 1		Survey 2		Difference survey 1-survey 2	p-value[3]
		Mean	p-value[2]	Mean	p-value[2]		
South Asia							
		2004		**2014**			
			***		***		
	No education	49.17		42.01		-7.16	***
Bangladesh	Primary	40.89		35.07		-5.82	***
	Secondary	37.81		36.39		-1.42	*
	Higher	38.70		38.80		0.10	*
	Total	44.76		38.29		-6.47	***
		1998-99		**2005-06**			
			***		***		
	No education	43.82		41.63		-2.18	
India	Primary	37.68		41.70		4.02	***
	Secondary	34.11		36.00		1.89	***
	Higher	30.56		36.23		5.67	***
	Total	39.53		40.13		0.60	***
		2001		**2011**			
			***		***		
	No education	46.98		43.15		-3.83	***
Nepal	Primary	37.95		34.72		-3.23	*
	Secondary	31.18		31.98		0.80	ns
	Higher	26.30		41.86		15.55	ns
	Total	44.57		39.08		-5.49	***
		2006-07		**2012-13**			
			***		***		
	No education	48.46		48.27		-0.20	ns
Pakistan	Primary	39.20		41.23		2.03	*
	Secondary	33.43		37.75		4.32	ns
	Higher	35.38		34.25		-1.13	ns
	Total	45.25		44.12		-1.13	***

Continued

Table 19—*Continued*

Country	Education	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
Southeast Asia							
		2005		**2014**			
			ns		***		
	No education	32.36		30.33		-2.02	ns
Cambodia	Primary	32.80		31.60		-1.20	ns
	Secondary	33.83		32.65		-1.18	ns
	Higher	***34.75***	[4]	35.52		0.77	ns
	Total	33.02		31.91		-1.11	ns
		2002-03		**2012**			
			***		***		
	No education	47.22		48.78		1.56	ns
Indonesia	Primary	36.10		35.52		-0.58	*
	Secondary	27.44		30.81		3.36	ns
	Higher	32.22		32.84		0.62	ns
	Total	34.58		34.04		-0.54	***
		2003		**2013**			
			***		***		
	No education	36.27	[4]	37.92		1.65	ns
Philippines	Primary	27.35		28.05		0.70	**
	Secondary	26.63		26.37		-0.26	ns
	Higher	28.77	[4]	37.92		9.15	**
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases,

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

The first birth interval has become shorter over time among most educational groups in Bangladesh, but lengthened over time in India. In contrast to this widespread change, change has been concentrated among selected educational groups in Nepal (shorter among women with no or primary education), Pakistan (longer among women with primary education), and the Philippines (longer among women with primary and with higher education). In summary, trends in the first birth interval by education have been neither widespread nor consistent in direction across study countries.

5.2.2. Occupation

As shown in Table 20, women's occupation is associated with the first birth interval in all six study countries[16]. In the Philippines, occupation has become salient over time; there was no significant association with the first birth interval in 2003. In Cambodia, the level of significance has weakened over time.

[16] Women's occupation is not available in the Bangladesh DHS surveys included in this study.

Table 20. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by occupation

Country	Occupation	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
South Asia							
			***		***		
	Not working	36.86		37.69		0.83	***
	Agricultural	43.00		40.88		-2.12	***
	Professional/technical/ managerial	39.32		44.73		5.41	***
India	Clerical	33.70		47.72		14.02	***
	Sales	35.66		38.12		2.46	ns
	Services	48.82		41.17		-7.64	ns
	Skilled/unskilled manual	45.98		43.09		-2.89	***
	Other	46.95		30.14	[4]	-16.81	ns
	Total	39.53		40.13		0.60	***
		2001		**2011**			
			***		***		
	Not working	41.75		39.09		-2.66	***
	Agricultural	45.16		39.79		-5.37	***
	Professional/technical/ managerial	33.70		41.67		7.97	ns
Nepal	Clerical	s	[4]	25.85	[4]	-2.93	ns
	Sales	na		na		--	--
	Services	52.87		35.26		-17.61	ns
	Skilled manual	s		35.19			ns
	Unskilled manual	40.57	[4]	33.10		-7.47	ns
	Other	s		102.71		66.28	ns
	Total	44.57		39.08		-5.49	***
		2006-07		**2012-13**			
			***		***		
	Not working	43.86		42.37		-1.49	***
	Agricultural	51.33		51.88		0.55	ns
	Professional/technical/ managerial	32.02		43.72		11.70	ns
Pakistan	Clerical	s	[4]	s		57.99	ns
	Sales	41.05		46.67		5.62	ns
	Services	47.10		41.28		-5.82	ns
	Skilled manual	53.82		46.32	[4]	-7.50	ns
	Unskilled manual	39.13	[4]	47.04		7.91	ns
	Other	na		na		--	--
	Total	45.25		44.12		-1.13	***

Continued

Table 20—*Continued*

Country	Occupation	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
Southeast Asia							
		2005	***	**2014**	*		
	Not working	54.64		28.96		-25.68	ns
	Agricultural	31.95		29.60		-2.35	ns
	Professional/technical/ managerial	45.03		31.20		-13.83	ns
Cambodia	Clerical	53.63		48.50		-5.14	ns
	Sales	34.77		32.15		-2.62	*
	Services	37.24	[4]	34.21		-3.03	ns
	Skilled manual	25.36	[4]	35.01		9.65	ns
	Unskilled manual	29.48		27.81		-1.67	ns
	Other	*30.67*	[4]	*41.49*		10.82	ns
	Total	33.02		31.91		-1.11	ns
		2002-03	***	**2012**	***		
	Not working	31.49		30.24		-1.25	**
	Agricultural	36.65		34.75		-1.90	ns
	Professional/technical/ managerial	33.21		41.13		7.91	ns
Indonesia	Clerical	31.35		35.75		4.40	ns
	Sales	33.94		34.20		0.26	ns
	Services	45.39		33.32		-12.07	ns
	Skilled manual	39.16		36.09		-3.08	ns
	Unskilled manual	s	[4]	25.38		8.09	ns
	Other	s		s	[4]	22.56	ns
	Total	34.58		34.04		-0.54	***
		2003	0.140	**2013**	***		
	Not working	25.24	[4]	27.60		2.35	***
	Agricultural	26.24		27.25		1.01	ns
	Professional/technical/ managerial	33.30		37.40		4.10	ns
Philippines	Clerical	30.11		35.62		5.50	ns
	Sales	28.76		33.15		4.40	ns
	Services	18.31		31.36		13.05	ns
	Skilled manual	27.61		31.56		3.95	ns
	Unskilled manual	26.42		26.68		0.27	ns
	Other	s	[4]	s	[4]	-2.38	ns
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

na indicates indicator is not available for the survey.

Indonesia, Cambodia, and Philippines DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India DHS (NFHS) and Indonesia DHS captures husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

India DHS (NFHS) do not distinguish between skilled manual and unskilled manual.

Nepal and Pakistan DHS do not include a separate category for sales; women in these occupations are included in "other" occupations.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

Overall, women who are not working or who work in agricultural or unskilled manual labor positions have shorter first birth intervals while women employed in professional or clerical occupations have longer first birth intervals. The pattern is slightly different in Pakistan, where women employed in professional occupations have first birth intervals similar in duration to those among women who are not working. Women engaged in agricultural occupations have longer birth intervals.

Outside of India, where the first birth interval has changed significantly for 5 of 8 occupational groups, change has not been widespread but concentrated in selected occupations. The first birth interval has become significantly shorter over time among women who are not working in Nepal, Pakistan, and Indonesia, and nearly significantly so in Cambodia (p=0.052). However, there was a lengthening of the first birth interval among non-working women in India and the Philippines. The first birth interval became shorter for Indian and Nepali women working in agriculture, and became longer for Indian women working in professional and clerical occupations.

5.3. First Birth Interval and Wealth

Household wealth quintile is salient to the first birth interval in all study countries but Cambodia. These associations have been consistent over both survey times, as seen in Table 21. However, the pattern of the association is not consistent across study countries or across South and Southeast Asian regions. There is a monotonic negative relationship between household wealth quintile and the first birth interval in India, Nepal, and Pakistan. In Indonesia, first birth intervals become shorter with increasing wealth, but not monotonically. On the other hand, there is a positive (non-monotonic) relationship in Bangladesh and the Philippines. In Cambodia, the first birth interval is shorter among women in the poorest and the richer wealth quintile and longer among women in the middle and richest quintiles, although these differences are not significant.

Table 21. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by household wealth quintile

		Survey 1		Survey 2		Difference survey 1-survey 2	
Country	Wealth	Mean	p-value[2]	Mean	p-value[2]		p-value[3]
South Asia							
		2004		**2014**			
			***		***		
Bangladesh	Poorest	52.69		37.47		-15.22	***
	Poorer	41.39		36.97		-4.43	***
	Middle	43.93		37.79		-6.14	***
	Richer	44.49		38.43		-6.07	***
	Richest	42.09		39.54		-2.54	ns
	Total	44.76		38.29		-6.47	***
			***		***		
India	Poorest	46.90		43.79		-3.10	***
	Poorer	43.48		43.08		-0.40	ns
	Middle	38.60		38.86		0.25	ns
	Richer	37.82		38.10		0.28	ns
	Richest	35.11		36.43		1.32	***
	Total	39.53		40.13		0.60	***

Continued

Table 21—*Continued*

Country	Wealth	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
		2001	***	**2011**	***		
Nepal	Poorest	45.50		40.37		-5.13	***
	Poorer	48.64		40.32		-8.32	***
	Middle	42.55		39.78		-2.77	***
	Richer	42.11		36.88		-5.23	***
	Richest	41.28		36.89		-4.39	***
	Total	44.57		39.08		-5.49	***
		2006-07	***	**2012-13**	***		
Pakistan	Poorest	52.84		50.22		4.72	ns
	Poorer	46.09		48.22		-0.42	ns
	Middle	47.61		43.29		0.74	***
	Richer	45.05		41.49		-0.62	***
	Richest	34.33		39.01		-2.26	ns
	Total	45.25		44.12		-1.13	***
Southeast Asia							
		2005	ns	**2014**	ns		
Cambodia	Poorest	30.88		29.93		-0.95	ns
	Poorer	30.73		30.24		-0.49	ns
	Middle	34.81		32.32		-2.49	ns
	Richer	29.77		29.41		-0.36	ns
	Richest	35.62		33.53		-2.09	ns
	Total	33.02		31.91		-1.11	ns
		2002-03	***	**2012**	***		
Indonesia	Poorest	36.68		35.91		-0.77	ns
	Poorer	35.01		34.88		-0.13	ns
	Middle	35.59		31.77		-3.83	***
	Richer	31.79		31.28		-0.51	ns
	Richest	30.54		33.49		2.95	ns
	Total	34.58		34.04		-0.54	***
		2003	***	**2013**	***		
Philippines	Poorest	26.19		25.05		-1.14	ns
	Poorer	25.42		24.33		-1.09	ns
	Middle	27.31		32.61		5.29	ns
	Richer	30.14		32.67		2.53	ns
	Richest	29.17		36.47		7.30	*
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

The largest differentials between richest and poorest wealth quintiles are observed in the Philippines, where women in the richest households have first birth intervals that are 11.4 months *longer* than women in the poorest households, and in Pakistan, where women in the richest households have first birth intervals that are 11.2 months *shorter* than women in the poorest households.

The first birth interval has become significantly shorter for women of all wealth levels in Bangladesh and Nepal. Elsewhere, change has been more concentrated and inconsistent in direction. The first birth interval has become shorter among the poorest Indian women and longer among the richest Indian women. In Pakistan, change has been significant among the middle and richer quintiles, and approaching significance (p=0.052) among women in the richest quintile. However, the first birth interval lengthened for the former group and shortened for the latter two groups of women. The first birth interval shortened only among the middle wealth quintile in Indonesia and lengthened only among the richest wealth quintile in the Philippines.

In spite of the variation in time trends, the absolute differential between richest and poorest wealth quintiles narrowed over time in six of seven countries. In Bangladesh, the differential even reversed direction. While women in the richest households had first birth intervals that were 10.6 months shorter, on average, than women in the poorest households in 2004, women in the richest quintile had first birth intervals that were 2.1 months longer, on average, than women in the poorest households by 2014. However, the differential widened in the Philippines, with women in richest households having first birth intervals that were 3 months longer than poorest women in 2003 compared to 11.4 months longer in 2013.

5.4. First Birth Interval and Religion

Table 22 indicates that religion is significantly associated with the first birth interval only in India, Nepal, and the Philippines. There is no association in Bangladesh and Cambodia, while an association could not be assessed in Pakistan and Indonesia[17].

[17] Data on religious affiliation are not available in DHS surveys for Pakistan and Indonesia.

Table 22. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by religion

Country	Religion	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
South Asia							
		2004		**2014**			
			ns		ns		
	Muslim	45.19		38.34		-6.85	***
Bangladesh	Christian	***53.19***		***27.04***		-26.15	ns
	Buddhist	s		26.52	[4]	-47.49	ns
	Hindu	40.15		36.98		-3.17	*
	Total	44.76		38.29		-6.47	***
			***		***		
	Muslim	37.48		37.15		-0.33	ns
	Christian	30.36		30.74		0.38	ns
	Buddhist	30.28		35.05		4.77	***
India	Hindu	41.10		41.64		0.55	***
	Other	34.63		31.73		-2.90	ns
	Sikh	26.62		29.91	[4]	3.29	***
	Jain	33.09		28.88	[4]	-4.22	ns
	Total	39.53		40.13		0.60	***
		2001		**2011**			
			***		**		
	Muslim	52.76		40.33		-12.42	***
Nepal	Buddhist	38.84		37.87		-0.98	ns
	Hindu	44.72		38.93		-5.79	***
	Other	33.95		34.11		0.16	ns
	Kirat	***45.40***		36.65		-8.76	ns
	Total	44.57		39.08		-5.49	***
Southeast Asia							
		2005		**2014**			
			ns		ns		
	Muslim	31.94		33.22		1.28	ns
Cambodia	Christian	28.98		38.85		9.87	ns
	Buddhist	33.12		31.63		-1.49	ns
	Other	31.35		32.98		1.63	ns
	Total	33.02		31.91		-1.11	ns
		2003		**2013**			
			***		***		
	Muslim	31.24		28.77		-2.47	ns
	Other	27.02		28.64		1.62	ns
Philippines	Roman Catholic	27.45		30.50		3.04	*
	Protestant	22.33	[4]	36.03		13.70	ns
	Iglesia Ni Kristo	32.98		28.26		-4.72	ns
	Aglipay	29.25		25.27		-3.98	ns
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

Pakistan and Indonesia DHS do not collect data on religion.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

The pattern across religious groups also varies across countries. In Nepal, Muslim women have longer first birth intervals than do the Hindu majority or any other faith group. In India, it is the reverse. Hindu women have the longest first birth intervals and Muslim women have shorter first birth intervals, although not as short as Sikh and Jain women. In the Philippines, Roman Catholic and Protestant women have the longest first birth intervals while Aglipay women have the shortest birth intervals. Muslim women in the Philippines have neither the longest nor the shortest first birth intervals, and approach the national average.

The first birth interval has changed in duration only among certain religious groups; these birth intervals have become significantly longer among Buddhist, Sikh, and (by a small amount) Hindu women in India and Roman Catholic women in the Philippines. The first birth interval has also become significantly shorter among Muslim and Hindu women in both Bangladesh and Nepal.

5.5. First Birth Interval and Residence

Place of residence is associated with the first birth interval in five of seven study countries. Urban/rural differences appear to be more salient in South Asia than in Southeast Asia, with Indonesia the only Southeast Asian countries of the three in the study to manifest a statistical relationship between residence and the first birth interval. The observed patterns of association have remained the same at both time points in all seven study countries.

Table 23. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by place of residence

Country	Residence	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
South Asia							
		2004		**2014**			
			*		***		
Bangladesh	Rural	44.53		37.09		-7.44	***
	Urban	45.03		40.50		-4.53	***
	Total	44.76		38.29		-6.47	***
			***		***		
India	Rural	40.70		41.04		0.34	ns
	Urban	37.30		38.16		0.86	***
	Total	39.53		40.13		0.60	***
		2001		**2011**			
			***		***		
Nepal	Rural	45.10		39.77		-5.33	***
	Urban	39.82		36.67		-3.15	ns
	Total	44.57		39.08		-5.49	***
		2006-07		**2012-13**			
			***		***		
Pakistan	Rural	48.11		47.00		-1.12	*
	Urban	40.29		40.74		0.44	***
	Total	45.25		44.12		-1.13	***

Continued

Table 23—*Continued*

Country	Residence	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
Southeast Asia							
		2005		**2014**			
			ns		ns		
Cambodia	Rural	32.69		30.18		-2.51	ns
	Urban	32.51		34.43		1.92	ns
	Total	33.02		31.91		-1.11	ns
		2002-03		**2012**			
			***		***		
Indonesia	Rural	35.74		34.00		-1.74	*
	Urban	32.11		34.20		2.10	ns
	Total	34.58		34.04		-0.54	***
		2003		**2013**			
			ns		ns		
Philippines	Rural	25.88		30.16		4.27	*
	Urban	29.40		30.82		1.42	*
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

First birth intervals are longer among women living in urban areas in Bangladesh and Indonesia (p=0.000), although the differences are small in Indonesia. They are shorter among women living in urban areas in India, Nepal, and Pakistan (p=0.000). In Pakistan, women in rural areas have first birth intervals that are, on average, nearly 7 months longer than women living in urban areas.

The first birth interval has become significantly shorter among both rural and urban residents in Bangladesh (p≤0.001), but has become shorter only among rural residents in Nepal, Pakistan, and Indonesia. It has become significantly longer among urban residents in India, Pakistan, and Indonesia, and among both rural and urban residents in the Philippines. The urban-rural differential has increased between Survey 1 and Survey 2 in Bangladesh, but has diminished in India, Nepal, Pakistan, and Indonesia.

5.6. First Birth Interval and Region

Regional differences characterize the mean first birth interval throughout most of the study countries. Regional differences are most notable in India where 22.6 months separate women in the state with the longest first birth interval (Andhra Pradesh) and those in the state with the shortest first birth interval (Nagaland). The differential is smallest in neighboring Nepal, where women in the mountain region have first birth intervals that are 3.8 months longer than women in the hill region.

Table 24. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by subnational region

Country	Region	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
South Asia							
		2004	***	**2014**	***		
Bangladesh	Dhaka	44.85		38.03		-6.81	***
	Barisal	42.10		34.27		-7.83	***
	Chittagong	39.71		32.55		-7.16	***
	Khulna	43.75		41.29		-2.45	*
	Rajshahi & Rangpur	48.08		40.21		-7.87	***
	Sylhet	47.68		39.24		-8.45	***
	Total	44.76		38.29		-6.47	***
		1998-99	***	**2005-06**	***		
India	Uttar Pradesh & Uttaranchal	43.82		36.76		-7.1	***
	Andhra Pradesh	25.59		49.18		23.6	***
	Arunachal Pradesh	51.71		30.38		-21.3	***
	Assam	33.03		35.26		2.2	***
	Bihar & Jharkhand	43.41		45.58		2.2	ns
	Delhi	29.84		35.33		5.5	***
	Goa	43.20		47.85		4.6	ns
	Gujarat	39.58		40.05		0.5	ns
	Haryana	31.61		35.23		3.6	***
	Himachal Pradesh	29.81		30.84		1.0	ns
	Jammu & Kashmir	31.10		30.35		-0.8	ns
	Karnataka	39.48		39.75		0.3	ns
	Kerala	35.26		39.09		3.8	***
	Madhya Pradesh	44.09		42.94		-1.1	ns
	Maharashtra	44.65		40.71		-3.9	ns
	Manipur	22.14		28.65		6.5	***
	Meghalaya	20.20	[4]	29.56		9.4	***
	Mizoram	23.96		26.79		2.8	ns
	Nagaland	19.96		26.57		6.6	ns
	Orissa	45.95		37.35		-8.6	ns
	Punjab	26.05		30.60		4.5	***
	Rajasthan	45.14		46.25		1.1	ns
	Sikkim	25.09		33.23		8.1	***
	Tamil Nadu	43.74		42.16		-1.6	ns
	Tripura	32.53		38.55		6.0	***
	West Bengal	42.73		40.06		-2.7	ns
	Total	39.53		40.13		0.60	***
		2001	***	**2011**	***		
Nepal	Terai	44.90		39.52		-5.4	***
	Mountain	46.05		41.24		-4.8	***
	Hill	42.05		37.41		-4.6	***
	Total	44.57		39.08		-5.49	***
		2006-07	***	**2012-13**	***		
Pakistan	Punjab	43.72		44.31		0.6	***
	Sindh	47.63		39.85		-7.8	***
	Khyber Pakhtunkwa	41.24		43.75		2.5	ns
	Balochistan	51.64		46.95		-4.7	***
	Total	45.25		44.12		-1.13	***

Continued

Table 24—*Continued*

Country	Region	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
Southeast Asia							
		2005	***	**2014**	***		
	Phnom Penh	34.62		34.26		-0.4	ns
	Banteay Mean Chey	31.53		28.15		-3.4	ns
	Kampong Cham	35.88		32.87		-3.0	*
	Kampong Chhnang	36.56		28.72		-7.8	ns
	Kampong Speu	36.38		32.58		-3.8	***
	Kampong Thom	34.36		24.06	[4]	-10.3	*
	Kandal	26.60		31.45		4.9	ns
	Kratie	30.63		35.43		4.8	***
	Prey Veng	35.32		30.92	[4]	-4.4	ns
	Pursat	28.15		25.69		-2.5	ns
Cambodia	Siem Reap	30.56		26.58		-4.0	ns
	Svay Rieng	35.21		29.00		-6.2	ns
	Takeo	29.92		36.51		6.6	*
	Otdar Mean Chey	21.61		26.81	[4]	5.2	***
	Battambang & Pailin	32.79		26.65		-6.1	ns
	Kampot & Kep	32.63		33.15		0.5	ns
	Preah Sihanouk & Kaoh Kong	30.21		33.39		3.2	ns
	Preah Vihear & Steung Treng	27.83		33.06		5.2	ns
	Mondol Kiri & Rattanak Kiri	33.46		29.53		-3.9	*
	Total	33.02		31.91		-1.11	ns
		2002-03	***	**2012**	***		
	Sumatera	30.61		27.87		-2.7	***
	Java	37.98		35.60		-2.4	***
Indonesia	Bali & Tenggara	33.53		29.90		-3.6	***
	Kalimantan	29.25		32.83		3.6	ns
	Sulawesi, Maluku & Papua	39.31		38.84		-0.5	ns
	Total	34.58		34.04		-0.54	***

Continued

Table 24—*Continued*

Country	Region	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
		2003		2013			
			***		***		
	National Capital	32.09		31.76		-0.3	ns
	Cordillera	22.11		25.39		3.3	ns
	I - Ilocos	28.23		27.03		-1.2	ns
	II - Cagayan Valley	25.28		25.71		0.4	ns
	III - Central Luzon	28.26		30.54		2.3	ns
	IVA - Calabarzon	28.43		29.25		0.8	ns
	IVB - Mimaropa	29.43		23.11		-6.3	ns
	V - Bicol	20.13	[4]	28.40		8.3	ns
Philippines	VI - Western Visayas	25.26		29.00		3.7	ns
	VII - Central Visayas	27.31		25.42		-1.9	ns
	VIII - Eastern Visayas	27.99		30.79		2.8	ns
	IX - Zamboanga Peninsula	24.83		32.52		7.7	ns
	X - Northern Mindanao	21.47		32.19		10.7	**
	XI - Davao	22.77	[4]	23.52	[4]	0.8	ns
	XII - Soccskargen	20.89		30.77		9.9	ns
	XIII - Caraga	26.15		36.94		10.8	ns
	ARMM	32.54		29.40		-3.1	**
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

Changes in the first birth interval have been widespread across regions of Bangladesh (all 7 divisions), Pakistan (3 of 4 regions), and Indonesia (3 of 5 province groups). The first birth interval has changed in duration in 12 of 26 states or state pairs in India. However, change has been restricted to just a few regions in Cambodia (6 of 19 regions) and the Philippines (2 of 17 regions).

5.7. First Birth Interval and Husbands' Education and Occupation

Two variables that describe husbands' characteristics—education and occupation—and their association with the first birth interval are presented in Table 25 and Table 26, respectively.

5.7.1. Husband's education

Husband's education is significantly associated with the first birth in all seven study countries, although in Cambodia, the association only became detectable in the most recent survey (2014), as was the case with marriage age. In most cases, the first birth interval becomes shorter with increasing levels of husband's education. Bangladesh and Indonesia suggest slight exceptions to this overall pattern. The first birth interval becomes longer again among women married to men with higher education in Indonesia and with secondary and higher education in Bangladesh.

Table 25. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by husband's education

Country	Education	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
South Asia							
		2004	***	**2014**	***		
Bangladesh	No education	47.65		39.90		-7.75	***
	Primary	42.98		34.19		-8.79	***
	Secondary	42.67		38.26		-4.42	***
	Higher	41.64		40.34		-1.30	ns
	Don't know	na		na		--	--
	Total	44.76		38.29		-6.47	***
			***		***		
India	No education	45.28		43.12		-2.16	***
	Primary	40.50		39.12		-1.39	ns
	Secondary	36.52		38.48		1.96	***
	Higher	35.10		34.91		-0.19	ns
	Don't know	na		67.11		--	--
	Total	39.53		40.13		0.60	***
		2001	***	**2011**	***		
Nepal	No education	48.85		43.33		-5.52	***
	Primary	44.92		40.55		-4.36	***
	Secondary	36.74		35.67		-1.07	***
	Higher	33.10		34.47		1.37	ns
	Don't know	75.40		***50.61***		-24.79	ns
	Total	44.57		39.08		-5.49	***
		2006-07	***	**2012-13**	***		
Pakistan	No education	51.50		47.51		-3.99	*
	Primary	42.40		44.99		2.59	*
	Secondary	42.71		42.29		-0.41	***
	Higher	36.53		38.23		1.69	ns
	Don't know	s	[4]	***98.71***		55.12	ns
	Total	45.25		44.12		-1.13	***
Southeast Asia							
		2005	ns	**2014**	**		
Cambodia	No education	33.81		32.14		-1.67	ns
	Primary	31.49		30.57		-0.92	ns
	Secondary	31.13		31.52		0.39	ns
	Higher	40.44		30.68		-9.76	ns
	Don't know	52.44		58.95		6.51	ns
	Total	33.02		31.91		-1.11	ns
		2002-03	***	**2012**	***		
Indonesia	No education	50.11		47.63		-2.48	ns
	Primary	36.49		35.07		-1.42	ns
	Secondary	29.79		30.85		1.06	ns
	Higher	26.34		30.33		3.99	ns
	Don't know	81.05		93.39		12.33	ns
	Total	34.58		34.04		-0.54	***

Continued

Table 25—*Continued*

Country	Education	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
		2003	***	2013	***		
Philippines	No education	32.99		37.68		4.69	ns
	Primary	26.92		26.78		-0.14	ns
	Secondary	26.93		29.20		2.28	*
	Higher	29.52		35.25		5.73	*
	Don't know	s		s	[4]	-39.12	ns
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

The disparity in the first birth interval between those married to men with the least education and with the most education ranges from a difference of about 2 months in Cambodia and the Philippines to 17.3 months in Indonesia.

The first birth interval has become shorter over time among most educational categories in Bangladesh and Nepal, but such change is isolated among women married to men with no education in India (p≤0.001) and women married to men with no education (p=0.049) and with secondary education (p=0.001) in Pakistan. There has been a significant lengthening of the first birth interval only among Indian women married to men with secondary education (p≤0.001) and Pakistani women married to men with primary education (p=0.014), and among Philippine women married to men with secondary or higher education (p≤0.05). The disparity according to husband's education has decreased over the two survey periods in all seven countries.

5.7.2 Husband's occupation

Husband's occupation is significantly associated with the first birth interval in all seven study countries, although at a lower level of significance (p≤0.05) in Cambodia and the Philippines. There had been no detectable association between husband's occupation and the first birth interval in Survey 1 in these two countries. In general, first birth intervals are longer among women married to men who are not working or who are employed in agricultural occupations. They are usually shorter among women married to men working in professional, clerical, sales, and service occupations. This pattern does not hold in Cambodia and the Philippines, where women married to men in professional occupations have relatively long first birth intervals and those married to men in unskilled labor positions have relatively short intervals.

Table 26. Mean[1] marriage to first birth interval (in months) among ever-married women age 25-49, by husband's occupation

Country	Occupation	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
South Asia							
			***		***		
	Agricultural	41.60		42.76		1.15	***
	Professional/technical/ managerial	35.30		36.16		0.86	ns
	Clerical	34.94		36.63		1.69	ns
India	Sales	36.03		36.95		0.92	ns
	Services	38.90		38.24		-0.65	ns
	Unskilled/skilled manual	38.84		38.20		-0.63	ns
	Other	41.70		51.83		10.14	***
	Not working	48.47		51.62		3.15	ns
	Total	39.53		40.13		0.60	***
		2001		**2011**			
			***		***		
	Agricultural	46.71		39.79		-6.9	***
	Professional/technical/ managerial	38.90		36.51		-2.4	**
	Clerical	43.16		35.95		-7.2	***
Nepal	Sales	na		na		--	--
	Services	42.82		37.82		-5.0	***
	Skilled manual	39.31		38.83		-0.5	*
	Unskilled manual	40.50		38.10		-2.4	*
	Other	39.55		48.12		8.6	ns
	Not working	na		na		--	--
	Total	44.57		39.08		-5.49	***
		2006-07		**2012-13**			
			***		***		
	Agricultural	56.40		54.70		-1.7	*
	Professional/technical/ managerial	33.03		39.92		6.9	ns
	Clerical	43.10		32.13		-11.0	**
Pakistan	Sales	41.01		32.71		-8.3	***
	Services	45.73		32.92		-12.8	***
	Skilled manual	37.41		43.57		6.2	ns
	Unskilled manual	42.74		47.36		4.6	*
	Other	s	[4]	s	[4]	-164.0	ns
	Not working	50.34		52.83		2.5	ns
	Total	45.25		44.12		-1.13	***

Continued

Table 26—*Continued*

Country	Occupation	Survey 1 Mean	Survey 1 p-value[2]	Survey 2 Mean	Survey 2 p-value[2]	Difference survey 1-survey 2	p-value[3]
Southeast Asia							
		2005	ns	**2014**	*		
	Agricultural	32.25		30.64		-1.6	ns
	Professional/technical/ managerial	33.71		33.98		0.3	ns
	Clerical	33.25		26.89		-6.4	ns
Cambodia	Sales	28.68		30.67		2.0	ns
	Services	39.30		32.58		-6.7	ns
	Skilled manual	29.11		31.20		2.1	ns
	Unskilled manual	29.64		23.03	[4]	-6.6	ns
	Other	41.37		32.14		-9.2	ns
	Not working	na		na		--	--
	Total	33.02		31.91		-1.11	ns
		2002-03	***	**2012**	***		
	Agricultural	36.76		36.34		-0.4	ns
	Professional/technical/ managerial	27.10		31.33		4.2	ns
	Clerical	26.90		29.68		2.8	ns
Indonesia	Sales	32.53		31.48		-1.1	ns
	Services	32.29		32.80		0.5	**
	Skilled manual	32.71		31.95		-0.8	ns
	Unskilled manual	30.89		23.68		-7.2	*
	Other	***38.16***		***30.61***		-7.5	ns
	Not working	50.17		54.17		4.0	ns
	Total	34.58		34.04		-0.54	***
		2003	ns	**2013**	*		
	Agricultural	25.40		27.45		2.0	**
	Professional/technical/ managerial	29.63		37.08		7.4	ns
	Clerical	44.56		21.20	[4]	-23.4	ns
Philippines	Sales	27.91		35.43		7.5	ns
	Services	34.52		28.72		-5.8	ns
	Skilled manual	24.24		32.73		8.5	ns
	Unskilled manual	25.08	[4]	24.40		-0.7	ns
	Other	31.44		40.55		9.1	ns
	Not working	na		na		--	--
	Total	27.82		30.61		2.78	***

Notes:

p-values *≤0.05, **≤0.01, ***≤0.001, ns=not significant (p>0.05)

[1] An extended mean is computed to account for any underestimation in the restricted mean that would occur because the last observed analysis time is censored.

[2] p-value of significance of Tarone-Ware test for the equality of survivor functions across groups within each survey.

[3] p-value of significance of Tarone-Ware test for the equality of survivor functions across survey years.

[4] Extended mean is unnecessary because all failures are observed.

na indicates indicator is not available for the survey.

Indonesia, Cambodia, and Philippines DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India DHS (NFHS-2 and NFHS-3) and Indonesia DHS capture husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

India DHS (NFHS-2 and NFHS-3) do not distinguish between skilled manual and unskilled manual.

Nepal and Pakistan DHS do not include a separate category for sales; women in these occupations are included in "other" occupations.

s indicates that the indicator is suppressed because it is based on fewer than 25 unweighted cases.

indicators in italics are based on fewer than 50 unweighted cases and should be interpreted with caution.

Change in the first birth interval has been relatively widespread across husband's occupation in Nepal and Pakistan. Specifically, the first birth interval has become shorter over time in these two countries. The first birth interval has changed in only two occupational categories in India: it has become longer among women married to men in agricultural positions and "other" positions. There has been almost no discernible change in the first birth interval in husband's occupational groups in Southeast Asian countries in this study. Exceptions are Indonesian women married to men in service occupations — among whom first birth intervals have become slightly longer—and those married to men in unskilled manual labor positions—among whom intervals have become shorter.

6. Association of Marriage Age with the First Birth Interval

Tables 27 and 28 present the results of loglogistic accelerated failure time models estimating the interval from marriage to the first birth. These models are estimated using data from the most recent DHS survey (Survey 2). Results are presented as time ratios, the exponentiated coefficient, to ease interpretation so that a positive coefficient (TR>1) corresponds to a greater expected time to the first birth and a negative coefficient (TR<1) indicates a shorter expected time to the first birth. Observations (unweighted) and diagnostics of the model form for the hazard models are available in Appendix Tables 2 and 3.

Table 27. Effect of age at marriage on the marriage to first birth interval: Time ratios from unadjusted loglogistic hazard models (95% confidence intervals in parentheses)

	South Asia				Southeast Asia		
	Bangladesh	India	Nepal	Pakistan	Cambodia	Indonesia	Philippines
Age at first marriage	0.976*** (0.97 - 0.98)	0.962*** (0.96 - 0.96)	0.940*** (0.93 - 0.95)	0.978*** (0.97 - 0.98)	0.981*** (0.98 - 0.98)	0.977*** (0.97 - 0.98)	1.002 (1.00 - 1.01)
Constant	33.25*** (29.68 - 37.25)	45.01*** (42.80 - 47.34)	77.35*** (65.32 - 91.59)	34.94*** (29.83 - 40.93)	28.71*** (26.22 - 31.44)	27.46*** (25.52 - 29.55)	14.16*** (12.85 - 15.60)
Gamma (γ)	0.5741 (0.56 - 0.59)	0.5277 (0.52 - 0.53)	0.4132 (0.40 - 0.43)	0.5732 (0.55 - 0.59)	0.3749 (0.36 - 0.39)	0.4401 (0.43 - 0.45)	0.479 (0.47 - 0.49)
Weighted sample size (person-months)	418,626	2,496,946	256,292	369,199	275,937	794,976	192,359

*** p≤0.001; ** p≤0.01; * p≤0.05

6.1. Age at Marriage

Table 27 displays the unadjusted time ratios for the effect of age at marriage on the length of the first birth interval. In 6 of the 7 study countries, marriage age is significantly associated with the length of the first birth interval at the 0.001 level; the Philippines is the sole exception. In each case, marriage age is negatively associated with the birth interval, so that with each additional year of age at which women marry, women experience a 2-6% shorter time to first birth. In the Philippines, the time ratio is greater than one; this suggests a positive relationship between marriage age and the length of the first birth interval, were it to be statistically significant.

Table 28 indicates that this relationship holds for the 6 countries when controlling for other covariates in an adjusted hazard model, with modest effects on the time ratios. Women in Bangladesh, India, and Nepal experience a first birth interval that is 4-6% shorter for each year of marriage delay. In Cambodia and Indonesia in Southeast Asia, and in Pakistan, women's expected first birth interval is 1-2% shorter for each year older at which they marry.

Table 28. Adjusted effects on the duration of the marriage to first birth interval: Time ratios from multivariate loglogistic hazard models

	South Asia				Southeast Asia		
	Bangladesh	**India**	**Nepal**	**Pakistan**	**Cambodia**	**Indonesia**	**Philippines**
Age at first marriage	0.949***	0.956***	0.940***	0.981***	0.978***	0.986***	1.009**
Birth cohort (ref=1960-69)							
1950-59	na	0.899***	na	na	na	na	na
1970-79	0.812***	1.128***	0.804***	0.959	0.934**	0.969	1.031
1980-89	0.671***	0.915***	0.713***	0.853***	0.899***	0.950**	0.967
Decisionmaking							
# of decisions in which respondent participates	1.009	0.981***	0.958***	1.011***	0.969	0.993	0.987
Wife beating attitudes (ref=acceptable in at least one scenario							
Rejects in all scenarios	na	0.994	0.913	1.032	1.007	0.992	0.993
Spousal age difference in years	0.987***	0.988***	1.000	0.998	1.002	1.003	1.010***
Education (ref=no education)							
Primary	0.988	1.01	0.958	0.977	1.04	0.997	0.907
Secondary	1.149***	1.078***	0.949	0.936	1.029	0.911	0.820**
Higher	1.602***	1.241***	1.245***	0.901*	1.031	0.947	0.778**
Occupation (ref=not working)							
Agricultural	na	0.950***	0.903**	0.877	0.998	0.998	0.984
Professional/technical/ managerial		1.058*	0.846*	1.122	1.047	1.039	0.945
Clerical	na	1.131**	0.819	1.142	1.029	1.111**	0.941
Sales	na	0.957	na	1.052	0.984	1.021	1.038
Services	na	0.881***	0.870***	1.005	1.056	1.012	0.928
Skilled manual	na		0.94	1.032	0.997	1.024	0.902*
Unskilled manual	na	0.958*	0.922	0.986	1.017	0.959	0.931**
Other	na	1.027	0.916	na	1.316*	3.790**	1.155
Household wealth quintile (ref=poorest)							
poorer	1.005	0.963*	1.026	0.925	0.964	0.987	0.940*
middle	0.987	0.959*	0.978	0.841*	0.977	0.967	0.982
richer	1.008	0.939**	0.890*	0.801**	0.999	0.968	1.022
richest	0.998	0.923***	0.914	0.761**	0.965	0.944*	1.011

Continued

Table 28—*Continued*

	South Asia				Southeast Asia		
	Bangladesh	**India**	**Nepal**	**Pakistan**	**Cambodia**	**Indonesia**	**Philippines**
Religion							
Reference religion	Muslim	Hindu	Hindu	na	Buddhist	na	Roman Catholic
Muslim	na	0.885***	1.054	na	0.924	na	1.126*
Christian	0.649	0.898***	na	na	0.947	na	na
Buddhist	1.009	1.011	0.973	na	na	na	na
Hindu	0.998	na	na	na	na	na	na
Other	na	1.109	1.031	na	0.947	na	0.976
Protestant	na	na	na	na	na	na	1.045
Iglesia Ni Kristo	na	na	na	na	na	na	0.888*
Aglipay	na	na	na	na	na	na	0.820*
Sikh	na	0.937	na	na	na	na	na
Jain	na	0.900	na	na	na	na	na
Kirat	na	na	0.929	na	na	na	na
Residence (ref=rural)							
urban	1.074**	0.951***	0.965	0.918*	1.060*	0.931***	0.99
Region (ref=region 1)							
Region 1	Dhaka	Uttar Pradesh & Uttaranchal	Terai	Punjab	Phnom Penh	Sumatera	National Capitol
Region 2	0.979	1.199***	1.102*	1.059	0.936	1.121***	0.865*
Region 3	0.881***	0.967	0.983	0.986	0.939	0.961*	0.915
Region 4	1.028	0.899**		1.039	1.117*	1.045**	0.933
Region 5	0.961	1.023			0.993	1.014	0.928
Region 6	0.964	1.045			1.058	1.044	0.869**
Region 7	0.918	1.166***			1.068		0.928
Region 8		1.130***			1.255***		0.898*
Region 9		1.138***			1.191***		0.894*
Region 10		0.898***			0.963		0.883*
Region 11		0.851***			1.022		0.941
Region 12		0.909***			1.144**		0.939
Region 13		0.923***			1.095		0.986
Region 14		1.099***			0.993		0.946
Region 15		0.977			1.06		0.911
Region 16		0.874***			1.112*		1
Region 17		0.98			1.026		1.119
Region 18		0.815***			1.007		
Region 19		0.959			1.021		
Region 20		0.962					
Region 21		1.013					
Region 22		1.307***					
Region 23		0.977					
Region 24		0.907***					
Region 25		1.026					
Region 26		0.866***					
Husband's education (ref=no education)							
Primary	0.909**	0.995	0.97	1.052	0.991	0.926	0.985
Secondary	0.973	1.022	0.977	1.037	0.981	0.894	0.971
Higher	1.115*	1.069**	0.989	1.094	0.982	0.922	0.939
Don't know	na	0.985	0.917	1.242	1.482	1.37	0.664**

Continued

Table 28—*Continued*

	South Asia				Southeast Asia		
	Bangladesh	**India**	**Nepal**	**Pakistan**	**Cambodia**	**Indonesia**	**Philippines**
Husband's occupation (ref=agricultural)							
Professional/technical/ managerial	na	1.006	0.970	1.116	0.961	0.918***	1.088
Clerical	na	1.011	1.059	0.988	0.943	0.949	0.940
Sales	na	0.979	na	na	0.933*	1.002	1.090
Services	na	1.038	1.039	1.021	1.002	0.919**	1.067
Skilled manual	na	1.000	0.971	1.087	1.013	0.966	1.049
Unskilled manual	na	na	0.998	1.030	0.942	0.936	1.027
Other	na	1.173	1.074	1.000	1.005	1.105	1.206
Not working	na	1.014	na	0.978	na	0.952	na
Constant	73.371*** (60.125 - 89.535)	60.107*** (55.626 - 64.949)	129.052*** (80.251 - 207.528)	38.011*** (29.652 - 48.727)	32.625*** (27.537 - 38.654)	27.882*** (23.408 - 33.210)	16.589*** (12.986 - 21.193)
Gamma (γ)	0.5492 (0.535 - 0.563)	0.5052 (0.499 - 0.511)	0.3955 (0.384 - 0.407)	0.5555 (0.537 - 0.575)	0.3629 (0.352 - 0.374)	0.4265 (0.418 - 0.435)	0.4695 (0.458 - 0.481)
Weighted sample size (person-months)	381,297	2,231,385	240,034	342,734	239,300	716,796	175,005

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Hazard models for Bangladesh excludes controls for: wife beating attitudes, occupation, and husband's occupation as these data were not collected in the Bangladesh 2014 DHS

India 2005-06 DHS (NFHS-3) does not distinguish between skilled manual and unskilled manual.

Hazard models for Indonesia and Pakistan exclude religious affiliation as these data were not collected in the Indonesia 2012 DHS or Pakistan 2012-13 DHS.

Indonesia 2012 DHS, Cambodia 2014 DHS, and Philippines 2013 DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India 2005-06 DHS (NFHS-3) and Indonesia 2012 DHS captures husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

Region names can be found in Appendix Table 5.

While there was no significant bivariate association in the Philippines, marriage age is significantly and positively associated with the first birth interval in the multivariate model. The effect is small (similar in size to the other Southeast Asian countries and Pakistan, but in the opposite direction): the expected time to first birth is 1% greater for each year older at marriage.

These relationships are stable to birth cohort and other socio-demographic controls in the multivariate hazard model.

6.2. Birth Cohort

The decadal birth cohort variable is significant in all countries but the Philippines; this indicates that the expected duration of the first birth interval has changed over time, even after controlling for age at marriage. The expected time to first birth has become shorter, monotonically, with successive birth cohorts since the 1960-69 birth cohort in Bangladesh, Nepal, Pakistan and in Cambodia and Indonesia. The changes are the most stark in Bangladesh and Nepal. Compared to the 1960-69 birth cohort, Bangladeshi women born between 1970-79 have a 19% shorter expected time to first birth and those born between 1980-89 have a 33% shorter expected time to first birth after marriage. In Nepal, these figures are 20% and 29%, respectively. In comparison, the expected interval from marriage to first birth is only 5-10% shorter in Cambodia and Indonesia for women born 1980-89 compared to those born 1960-69. In

Pakistan, this figure is 15% shorter. The differences in expected time to first birth are not significantly different between women born in 1970-79 and 1960-69 in Pakistan and Indonesia.

Birth cohorts in India manifest a different pattern than the monotonic decrease in the first birth interval over time that is seen elsewhere. Women born in the decade before the reference cohort show an expected time to first birth that is 10% shorter than those born in 1960-69. Those born in 1970-79 have an expected time to first birth that is 13% longer, while those born in 1980-89 have an expected interval that is 8.5% shorter than those born in 1960-69. Stated otherwise, the length of the interval from marriage to first birth increased among those born in 1960-69 and 1970-79 before becoming shorter again for the later cohort. These differences are all statistically significant at the $p \leq 0.001$ level.

6.3. Other Covariates

Three variables describe the gender context relative to women's empowerment. These are women's decision-making in the household, attitudes toward wife beating, and the spousal age difference. Of these three, wife beating attitudes showed no significant association with the length of the first birth interval in any of the study countries. The other two indicate statistically significant associations in three countries. India is the only country for which two gender variables—women's decision-making and spousal age difference—are associated with the length of the first birth interval net of each other and the other variables in the model.

The expected time from marriage to first birth decreases by 2-5% with increasing number of decisions in which the respondent is involved in India and Nepal. In Pakistan, each additional decision is associated with a 1% increase in the first birth interval. There is no association between women's decision-making and the first birth interval in any of the Southeast Asian countries, nor in Bangladesh.

The spousal age difference is associated with the first birth interval in Bangladesh, India, and the Philippines. In the two South Asian countries, Bangladesh and India, larger spousal age differences are associated with shorter first birth intervals, although the magnitude of the effect is small, with the expected time to first birth from marriage 1.1-1.2% shorter with each year of difference between spouses. In the Philippines, the difference is of similar magnitude in the opposite direction. The expected time to first birth is 1% longer with each added year difference in spouse's ages.

Among socio-demographic controls in the hazard model, women's education and rural/urban residence are most consistently associated with the first birth interval. Other covariates are more variable in their associations with the time from marriage to first birth across countries.

Net of age at marriage, birth cohort, and other controls, higher levels of women's education is significantly associated with a longer duration to first birth in Bangladesh, India, and Nepal. The magnitude of the effect is largest in Bangladesh. Women with higher than secondary education have an expected time to first birth that is 60% longer than women with no education here. In India and Nepal, this is closer to 25% longer. In contrast, women with higher education in the Philippines and Pakistan have shorter first birth intervals than women with no education. There is no association in Cambodia and Indonesia.

Urban residence is associated with the length of the first birth interval in five of the 7 study countries, but the direction of the effect is variable. In India, Pakistan, and Indonesia, urban residence is associated with a shorter birth interval. In Bangladesh and Cambodia, it is associated with a longer birth interval.

Neither employment status (not shown) nor occupation was consistently associated with the length of the first birth interval across study countries. Working in the last 12 months in agriculture, services, or

manual labor is associated with a shorter birth interval, while being employed in professional or clerical sectors is associated with a longer birth interval in India. Like in India, being employed in agriculture or services is associated with a shorter birth interval in Nepal, but unlike India, being employed in the professional sector is also associated with a shorter birth interval. Being employed in other employment in Indonesia and Cambodia is associated with a longer first birth interval, as is being employed in a professional position in Indonesia. In the Philippines, being engaged in manual labor is associated with a shorter birth interval. There is no association with any occupational category in Pakistan.

The length of the first birth interval is monotonically shorter with increasing wealth quintiles in India and Pakistan. However, household wealth is associated with a shorter birth interval (compared to those in the poorest household wealth quintile) only among those in the poorer quintile in Philippines, the richer quintile in Nepal, and the riches quintile in Indonesia.

Religion is seldom associated with differences in the first birth interval. Muslim and Christian women have first birth intervals that are 10-11% shorter than Hindu women in India. Muslim women have birth intervals that are 13% longer than Catholics in the Philippines, while women belonging to Iglesia Ni Kristo and Aglipay religions have a shorter birth interval.

Subnational region is inconsistently associated with the first birth interval outside of India. In Bangladesh, residence in only one of six divisions—Chittagong—is associated with a birth interval that is significantly different (shorter) than that in Dhaka. In Nepal, the birth interval is longer in the mountain region than in the terai but no differences in the hill region. In Cambodia, birth intervals are longer in 5 of 18 regions compared to Phnom Penh. In Indonesia, birth interval is significantly different in 3 of 5 province groups compared to Sumatera. In the Philippines, the first birth interval is significantly different (shorter) in 5 of 16 regions compared to the National Capital region. In India, however, 15 of 25 states have an expected time to first birth that is significantly different than Uttar Pradesh and Uttaranchal; in 9 states it is shorter and in 6 it is longer than in Uttar Pradesh and Uttaranchal. A listing of the region names corresponding to the time ratios in Table 29 can be found in Appendix Table 2.

Husband's education is seldom associated with the length of the first birth interval. In Bangladesh and India, women whose husbands have higher education have a shorter expected time to first birth from marriage than do women whose husbands have no education. Husband's occupation is similarly not associated with the first birth interval in most countries. In Pakistan, women whose husbands are not working or are in "other" employment have shorter birth intervals than do women with husbands employed in agriculture. In Cambodia, this is true for husbands working in sales and in Indonesia among husbands working in professional or services positions.

6.4. Underlying Hazard Distribution

The hazard model for the length of the first birth interval was fit using a loglogistic distribution, based on this model having the lowest or second-lowest AIC and BIC in all study countries (Appendix Table 2). In the unadjusted model with a single covariate for marriage age (Table 28), the shape parameter gamma (γ) ranges from 0.3749 in Cambodia to 0.5741 in Bangladesh. These parameters change little with the addition of covariates into the multivariate hazard model. In this model (Table 29), γ ranges from 0.3629 to 0.5492, respectively. The average difference between models is 0.0169. This implies a hazard distribution $h(t)$ that quickly increases to near 1 before declining with a long tail as time increases.

7. Multivariate Decomposition Results

While the previous section describes associations between indicators and the first birth interval, this section explores the effect of age at marriage and other covariates on the change in the first birth interval over time. To address this question, the change in the first birth interval is decomposed into two components, one representing changes in the distribution of women's characteristics (the "composition" or "endowments" component) and the other representing changes in the effect of those characteristics (the "effects", "rate", or "coefficients" component). The analysis presented in this section uses data from the two time points used earlier in this study, Survey 1 and Survey 2. Survey 2 is the most recent DHS survey and Survey 1 is a DHS survey conducted approximately 10 years prior.

As shown in the first results section, there was imperceptible change in the first birth interval when measured as the difference between the median completed ages at marriage and at first birth in Cambodia, the Philippines, and Pakistan, but this decreased substantially in Bangladesh, India, and Nepal. However, there is a significant change in the (extended) mean duration of the first interval over the last 10 years in every study country except Cambodia. Here, the observed decrease in the first birth interval of just over 1 month is not statistically significant. The significant decline in the duration of the first birth interval ranges from 0.5 months (Indonesia) to 6.5 months (Bangladesh). In India, the first birth interval increased by 0.6 months and in the Philippines by 2.8 months.

The results of the decomposition analysis indicate whether the change in the first birth interval is the result of changing composition of the population or a change in the effect that each variable has on the first birth interval over time. The results present the proportion of the change in the first birth interval attributed to the composition component, cumulatively, and to the effects component, cumulatively (Table 29). This study also presents the detailed results that show the contribution of compositional changes and effect for each covariate to the overall change in the first birth interval in Tables 30-32 and Appendix Tables 7-12. The multivariate decomposition models are estimated using age at marriage and each of the gender context, socio-demographic characteristics, and husband's covariates included in the hazards analysis of the preceding section.

7.1. Overall Decomposition Results

South Asia

Table 29 indicates that both the composition and effects components are significantly associated with the decrease in the first birth interval in Bangladesh and the increase in India. In both countries, a larger proportion (63% and 147%, respectively) of the change can be attributed to the effects component than the composition component. In India, the composition and effects component operate in opposing directions. Changes in the composition of characteristics across the population would have resulted in a small decrease in the first birth interval if the effects of those characteristics stayed constant; the change in the effects of covariates would have yielded an increase nearly 50% larger than what was actually observed if the composition of characteristics remained constant.

In Nepal and Pakistan, in contrast, there is no observed change in the effects of the covariates. Changes in the composition of characteristics account for the majority (97% and 86%, respectively) of the observed change in the first birth interval.

Table 29. Overall multivariate decomposition of change in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects

		Composition component			Effects component			Total	
	n	β		Percent	β		Percent	β	
South Asia									
Bangladesh 2004-2014	20,017	-1.67	***	36.76	-2.88	***	63.24	-4.55	***
India 1998/99-2005/06	139,267	-0.46	***	-46.77	1.43	***	146.77	0.98	***
Nepal 2001-2011	13,385	-5.18	***	97.17	-0.15		2.83	-5.33	***
Pakistan 2006-2013	17,685	-0.69	***	85.87	-0.11		14.13	-0.80	
Southeast Asia									
Cambodia 2005-2014	19,455	0.01		-107.99	-0.03		207.99	-0.01	
Indonesia 2002-2012	52,999	-1.69	***	115.00	0.22		-15.00	-1.47	***
Philippines 2003-2013	15,783	-0.82	***	-120.5	1.50	***	220.5	0.68	*

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Southeast Asia

As shown in Table 29, Indonesia shows similarities to Nepal and Pakistan. Here, 115% of the change in the first birth interval can be attributed to changes in the composition of characteristics across the population; there is no significant change detected in the effects of those characteristics. Like India, the Philippines also experienced an increase in the mean first birth interval and, like India, the composition component and effects component significantly contribute to change in opposing directions. Furthermore, a larger proportion of the change (221%) in the first birth interval is attributed to changes in the effects of covariates than can be attributed to compositional changes of those characteristics (-121%). In Cambodia, the overall change is not statistically significant, nor is either the composition or effects component.

7.2. Age at Marriage and Changes in the First Birth Interval

In the four South Asian countries in this study, age at marriage appears to be the most influential covariate associated with change in the first birth interval, as indicated in Table 30. Within the composition component, age at marriage is significantly associated with a decline in the first birth interval in all four countries. If nothing in the model changed between Survey 1 and Survey 2 except the age at which women married, the first birth interval would have become shorter by 0.6 months (Pakistan) to 2 months (Nepal). Between 38% (Nepal) and 89% (Bangladesh) of the change in the first birth interval can be attributed to changes in the age at marriage.

Within the effects component, we see that the effect of marriage age influences the change in the first birth interval in India and Nepal, but not in Bangladesh or Pakistan. The change in the effect of marriage age accounts for -232% to -437% of the change in the first birth interval in these two countries. In India, the first birth interval would be shorter by 4.3 months, on average, in 2005-06 than it was in 1998-99 if neither the composition nor effects of the other characteristics in the model changed. However, the first birth interval would be 12.4 months longer in Nepal if nothing else in the model changed between 2001 and 2011. Stated otherwise, women at all ages of marriage have a shorter first birth interval in India and a longer first birth interval in Nepal.

In both Southeast Asian countries where a significant proportion of the change in first birth interval can be attributed to the composition component, age at marriage is significantly associated with a decline in the first birth interval. Changes in the age at marriage explain 86% of the change in the first birth interval in Indonesia and -10% in the Philippines. If all else in the model remained constant, changes in the age at which women married would have resulted in an average first birth interval that is 1.3 months shorter in Indonesia. The difference is much smaller—a mere 0.1 month shorter—in the Philippines.

Table 30. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of marriage age

		Composition component			Effects component		
	n	β		Percent	β		Percent
South Asia							
Bangladesh 2004-2014	20,017	-1.75	***	38.44	1.51		-33.13
India 1998/99-2005/06	139,267	-0.87	***	-88.91	-4.27	***	-437.08
Nepal 2001-2011	13,385	-2.03	***	38.13	12.37	**	-231.83
Pakistan 2006-2013	17,685	-0.61	***	76.76	1.74		-217.66
Southeast Asia							
Cambodia 2005-2014	19,455	-0.36		2774.1	-8.06		61270
Indonesia 2002-2012	52,999	-1.26	***	86.14	0.6		-41.06
Philippines 2003-2013	15,783	-0.07	***	-10.4	1.57		230.51

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

There is no evidence that there is a significant change in the effects of marriage age over time in any of the Southeast Asian countries in the study. To the extent that changes in the first birth interval are due to changing effects of characteristics (in the Philippines), this is a result of changes in the effects of indicators other than age at marriage.

7.3. Gender Context and Changes in the First Birth Interval

Table 31 presents the detailed decomposition results for the three variables that describe the gender context. In Bangladesh, changes in the level of women's decision-making between 2004 and 2014 are not associated with the shortening first birth interval. However, the effect that women's decision-making has on the first birth interval has changed. If all else in the model were held constant, the effect of women's decision-making would be to lengthen the first birth interval by 1.6 months. The converse is the case in Nepal. Here, the effect of women's decision-making has not changed from 2001 to 2011. However, changes in the level of women's decision-making would have resulted in a first birth interval that is shorter by 1 month, with everything else held constant.

Neither changes in the level nor effect of women's decision-making has an influence on changes in the first birth interval in the Philippines. In Indonesia, both changes in the levels of women's decision-making and in the effects of women's decision-making contribute to the change in the first birth interval. Ceteris paribus, 2012 levels of women's decision-making would have resulted in a minute lengthening of the first birth interval whereas the effect of women's decision-making would shorten the first birth interval by more than 2 months.

Table 31. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of gender context variables

		Composition component			Effects component	
	n	β		Percent	β	Percent
Decision-making						
South Asia						
Bangladesh 2004-2014	20,017	0.11		-2.37	1.61	-35.28
Nepal 2001-2011	13,385	-1.04	***	19.41	-0.50	9.30
Southeast Asia						
Cambodia 2005-2014	19,455	-0.09		715.90	-2.31	17537.00
Indonesia 2002-2012	52,999	0.02	*	-1.51	-2.40	163.79
Philippines 2003-2013	15,783	-0.09		-13.10	-1.95	-286.31
Wife beating attitudes						
South Asia						
Nepal 2001-2011	13,385					
Acceptable in at least one scenario		-0.48		8.96	0.51	-9.61
Rejects in all scenarios		-0.48		9.03	-1.32	24.66
Southeast Asia						
Cambodia 2005-2014	19,455					
Acceptable in at least one scenario		0.01		-105.82	0.25	-1886.70
Rejects in all scenarios		0.02		-128.81	-0.16	1231.60
Indonesia 2002-2012	52,999					
Acceptable in at least one scenario		-0.01		0.65	-0.03	2.19
Rejects in all scenarios		-0.01		0.67	0.09	-5.90
Philippines 2003-2013	15,783					
Acceptable in at least one scenario		-0.01		-1.69	0.12	17.49
Rejects in all scenarios		-0.01		-1.65	-0.32	-47.55
Spousal age difference in years						
South Asia						
Bangladesh 2004-2014	20,017	0.18	***	-3.94	-1.43	31.38
India 1998/99-2005/06	139,267	0.15	***	15.35	-0.05	-4.89
Nepal 2001-2011	13,385	0.01		-0.17	0.82	-15.45
Pakistan 2006-2013	17,685	0.07	*	-8.71	0.47	-58.30
Southeast Asia						
Cambodia 2005-2014	19,455	0.01		-44.80	0.87	-6641.20
Indonesia 2002-2012	52,999	0.03		-1.71	-0.20	13.32
Philippines 2003-2013	15,783	0.00		0.29	-0.11	-15.75

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Women's attitudes toward wife beating are not associated with changes in the first birth interval, in either component, in any of the study countries.

Changes in spousal age difference are associated with lengthened first birth intervals in three of four South Asian countries; Nepal is the exception. However, changes in spousal age difference accounts for no more than 15% (India) of any change in the first birth interval. Changes in spousal age difference are not significantly associated with changes in the first birth interval in any Southeast Asian country in the study. There has been no change in the effect of spousal age difference in any study country.

7.4. Other Women's Socio-Demographic Characteristics and Changes in the First Birth Interval

Detailed decomposition results for women's socio-demographic characteristics can be found in Appendix Tables 7-12. Generally, there has not been a change in the effect of education on the first birth interval; India is an exception (Appendix Table 7). Changing education levels are associated with changes in the first birth interval in South Asia and among secondary and higher education levels in Southeast Asia, although the effect of these changes is small. The case is similar with household wealth quintile in most countries (Appendix Table 9). However, the effect of being in the poorer wealth quintile in the Philippines has changed, and now contributes -52% to all change in the first birth interval. Changes in the proportion of women who are not working contributes to changes in the first birth interval in Nepal, Pakistan, Indonesia, and the Philippines, however, there are no associations with shifts in women's occupation (Appendix Table 8)[18]. The opposite is true in India: no change in the first birth interval can be attributed to changes in the proportion of women who are not working, but can be attributed to shifts among some occupations. The effect of women's occupation on the first birth interval has not changed except in Indonesia, where substantial proportions of the change in the first birth interval can be attributed to the changing effects of occupation.

Although there are a few compositional changes in religion (Appendix Table 10) that are associated with the change in the first birth interval, they do not make a large contribution to changes in the first birth interval. The effect of religious affiliation remains unchanged.

Shifts in urban or rural residence are, by and large, associated with changes in the first birth interval, although only small proportions of change can be attributed to these shifts (Appendix Table 11). The effect of urban versus residence has not changed between the two surveys.

Changes in the first birth interval can be attributed to compositional shifts in residence in selected subnational regions in Bangladesh, India, Nepal, Indonesia, and the Philippines, but the magnitude of change attributable to these shifts are quite small (with the exception of residence in Andhra Pradesh in India). The effect of living in a given subnational region has changed in India, Nepal, Pakistan, and Indonesia. These results are presented in Appendix Table 12.

7.5. Husband's Characteristics and Changes in the First Birth Interval

As seen in Table 32, changes in levels of husband's education are significantly associated with changes in the first birth interval in Bangladesh, Indonesia, the Philippines, and to a lesser extent, in India but not in Nepal or Pakistan. The proportion of change associated with shifts in husbands' education is sizable in Indonesia and the Philippines. In the Philippines, the proportion rivals the proportion attributable to marriage age, although it is roughly half that in Indonesia. The effect of husband's education has changed

[18] Women's occupation is not included in the decomposition model for Bangladesh because no data for this indicator were collected in 2004.

over time only in Bangladesh and only for women whose husbands have primary only education or who do not know their husband's education level.

Table 32. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of husbands' characteristics

		Composition component			Effects component		
	n	β		Percent	β		Percent
Husbands' education							
South Asia							
Bangladesh 2004-2014	20,017						
No education		0.01		-0.27	0.39		-8.58
Primary		-0.03	***	0.65	-0.85	***	18.66
Secondary		-0.04		0.85	-0.22		4.93
Higher		0.15	***	-3.36	0.39	**	-8.56
Don't know							
India 1998/99-2005/06	139,267						
No education		0.00		0.17	-0.13		-13.57
Primary		0.02	*	2.44	0.01		0.82
Secondary		-0.01		-0.66	-0.13		-13.35
Higher		-0.06	**	-5.91	0.15		15.45
Don't know							
Nepal 2001-2011	13,385						
No education		-0.30		5.60	0.04		-0.79
Primary		0.02		-0.34	0.00		0.02
Secondary		-0.09		1.70	0.46		-8.59
Higher		0.01		-0.18	-0.10		1.87
Don't know		0.01		-0.12	-0.01		0.18
Pakistan 2006-2013	17,685						
No education		0.01		-0.73	0.18		-23.01
Primary		0.00		-0.37	-0.15		19.33
Secondary		0.00		0.06	0.18		-22.45
Higher		0.03		-4.13	0.55		-68.49
Don't know		0.00		0.03	-0.01		1.04
Southeast Asia							
Cambodia 2005-2014	19,455						
No education		0.01		-63.45	-0.41		3100.10
Primary		0.03		-247.53	-1.00		7636.50
Secondary		-0.07		528.63	-0.56		4273.80
Higher		-0.04		289.77	0.01		-50.64
Don't know		-0.02		153.87	0.06		-454.12
Indonesia 2002-2012	52,999						
No education		0.05		-3.37	0.00		0.08
Primary		0.60	*	-41.03	-2.19		149.33
Secondary		-0.66	*	45.28	-1.56		106.11
Higher		-0.16	*	10.69	-0.38		26.00
Don't know		0.00		-0.23	0.01		-0.91
Philippines 2003-2013	15,783						
No education		-0.01		-1.73	0.09		13.39
Primary		-0.07		-10.54	0.34		49.93
Secondary		0.08	*	12.24	0.72		105.96
Higher		0.01		0.96	0.46		67.76
Don't know		0.00	***	0.12	-0.01		-0.93

Continued

Table 32—*Continued*

	n	Composition component β		Composition component Percent	Effects component β		Effects component Percent
Husband's occupation							
South Asia							
India 1998/99-2005/06	139,267						
Agricultural		0.07		7.21	-0.16		-16.45
Professional/technical/ managerial		0.00		0.12	-0.08		-7.93
Clerical		0.00		-0.30	-0.03		-3.11
Sales		-0.05	***	-4.70	-0.12		-12.64
Services		0.00		-0.34	-0.04		-4.09
Skilled manual		-0.07	**	-7.60	-0.15		-15.69
Other		-0.04		-4.20	0.05		5.48
Not working		0.00		0.28	-0.04		-4.16
Nepal 2001-2011	13,385						
Agricultural		-0.28		5.31	0.86		-16.06
Professional/technical/ managerial		0.00		0.00	0.10		-1.85
Sales		0.02		-0.35	0.03		-0.56
Services		0.07		-1.32	-0.15		2.83
Skilled manual		-0.17	**	3.22	-0.03		0.47
Unskilled manual		-0.02		0.46	-0.01		0.19
Other		-0.12		2.27	0.10		-1.91
Pakistan 2006-2013	17,685						
Agricultural		0.01		-1.70	3.35	***	-418.05
Professional/technical/ managerial		0.00	***	0.54	1.89	***	-235.82
Clerical		-0.04		4.56	0.70	***	-87.27
Sales		0.00		-0.29	2.61	***	-326.27
Services		-0.01		0.63	1.87	***	-233.93
Skilled manual		0.02	***	-2.35	3.56	***	-444.86
Unskilled manual		0.10		-12.11	3.84	***	-479.81
Other		0.00	***	-0.12	-0.02	***	2.67
Not working		-0.01		0.84	0.57	***	-70.67
Southeast Asia							
Cambodia 2005-2014	19,455						
Agricultural		-0.08		590.49	1.46		-11080.00
Professional/technical/ managerial		0.00		-8.46	-0.10		777.04
Clerical		0.02		-185.25	-0.10		780.69
Sales		0.00		22.44	0.05		-371.04
Services		0.01		-90.73	-0.02		176.34
Skilled manual		0.26		-1987.30	0.54		-4121.50
Unskilled manual		0.13		-950.70	-0.14		1084.00
Other		-0.03		198.95	0.09		-659.32
Indonesia 2002-2012	52,999						
Agricultural		-0.08		5.53	-0.18		12.29
Professional/technical/ managerial		0.00		-0.21	0.05		-3.42
Clerical		0.00		-0.23	0.03		-2.28
Sales		-0.02	*	1.67	-0.05		3.70
Services		0.02		-1.47	-0.11		7.45
Skilled manual		0.19		-12.83	0.03		-2.23
Unskilled manual		0.12		-7.87	-0.27		18.16
Other		0.00		-0.30	0.00		-0.24
Not working		0.00		0.04	0.01		-0.53

Continued

Table 32—*Continued*

	n	Composition component		Effects component	
		β	Percent	β	Percent
Philippines 2003-2013	15,783				
Agricultural		0.01	1.39	0.05	7.73
Professional/technical/ managerial		0.01	1.52	0.21	31.25
Clerical		-0.02	-2.24	-0.03	-3.78
Sales		-0.09	-13.90	0.06	8.43
Services		0.00	0.43	-0.11	-15.89
Skilled manual		-0.07	-10.05	0.01	0.85
Unskilled manual		0.02	2.77	0.02	2.36
Other		-0.04	-6.37	0.02	2.52

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Shifts in husband's occupation are seldom associated with changes in the first birth interval and, when they are, they contribute modestly to that change. The effect of husband's occupation upon the first birth interval remains unchanged in all study countries except in Pakistan, where the effect of all occupational groups has changed and usually contributes substantially to the change in the first birth interval.

8. Marriage Age and Subsequent Birth Intervals

Prior demographic literature suggests that age at marriage can influence both the quantum and tempo of fertility, and not just the onset of childbearing. To explore this question, this study uses a multivariate hazard model to estimate associations between covariates and subsequent inter-birth intervals. Specifically, this study estimates models for the second birth interval. Restricting analysis of subsequent birth intervals to the second birth interval carries the advantage of limiting attrition of the sample size in a sample of women who have not completed their fertility, particularly in settings with declining fertility levels. As in the hazards analysis of the first birth interval, these models specify a loglogistic hazard distribution and are estimated with the age at marriage, birth cohort, gender context, and women's and husband's socio-demographic characteristics as covariates. In additional, a control for the duration of the first interval is included in the models.

Table 33. Effect of age at marriage on the duration of the second birth interval: Time ratios from unadjusted loglogistic hazard models

	South Asia				Southeast Asia		
	Bangladesh	India	Nepal	Pakistan	Cambodia	Indonesia	Philippines
Age at first marriage	1.035*** (1.027 - 1.042)	1.022*** (1.019-1.025)	1.025*** (1.018 - 1.032)	1.004 (1.000 - 1.008)	1.015*** (1.009 - 1.020)	1.013*** (1.009 - 1.017)	1.030*** (1.025 - 1.035)
Constant	25.913*** (23.102 - 29.067)	22.134*** (21.023-23.304)	22.265*** (19.909 - 24.901)	24.271*** (22.340 - 26.370)	29.202*** (26.292 - 32.434)	44.853*** (41.105 - 48.942)	18.189*** (16.494 - 20.058)
Gamma (γ)	0.4055*** (0.397 - 0.414)	0.3516*** (0.346-0.357)	0.3233*** (0.313 - 0.334)	0.3080*** (0.299 - 0.317)	0.3750*** (0.365 - 0.385)	0.4607*** (0.453 - 0.469)	0.4382*** (0.428 - 0.448)
Weighted sample size (person-months)	667,060	2,873,777	286,577	312,553	463,907	1,832,481	346,881

*** p≤0.001; ** p≤0.01; * p≤0.05

8.1. Age at Marriage

Table 33 displays the unadjusted time ratios for the effect of marriage age on the length of the second birth interval. In 6 of the 7 study countries, marriage age is significantly associated with the duration of the second birth interval. Pakistan is the exception. In all six countries, marriage age has a positive association with the length of the second birth interval. This finding contrasts with the negative association detected with the first birth interval.

Table 34 displays the results of the multivariate hazard models predicting the second birth interval. In all six countries (the exception being Pakistan), age at marriage remains significantly and positively associated with the second birth interval when controlling for other covariates in the model. The magnitude of the effect is not large. Women experience a second birth interval that is on average 1% longer with each year of age older at which women marry. However, the magnitude of the effect is virtually unchanged with the inclusion of other covariates.

Table 34. Adjusted effects on the duration of the second birth interval: Time ratios from multivariate loglogistic hazard models

	South Asia				Southeast Asia		
	Bangladesh	India	Nepal	Pakistan	Cambodia	Indonesia	Philippines
Age at first cohabitation in years	1.019***	1.013***	1.014***	1.003	1.010***	1.018***	1.020***
Duration of 1st birth interval (ref= <16 months)							
16-32 months	1.032	1.026**	0.967	1.01			
>32 months	1.109***	1.158***	0.992	1.073***			
Duration of 1st birth interval (ref= <12 months)							
12-22 months					0.993	1.022	1.003
>22 months					1.050*	1.161***	1.209***
Birth cohort (ref=1960-69)							
1950-59		0.959*					
1970-79	1.078**	1.009	1.027	1.024	1.053*	1.330***	1.118***
1980-89	1.207***	1.028	1.173***	1.033	1.255***	1.603***	1.306***
Decisionmaking							
number of decisions in which Respondent is involved	0.990	0.996	1.003	1.000	0.994	1.001	1.002
Wife beating attitudes (ref=wife beating is acceptable in at least one scenario							
Respondent rejects wife beating	na	1.008	1.065	1.026	1.053**	1.024	1.004
Spousal age difference in years	0.994***	1.002	1.001	0.999	1.007**	0.994***	0.999
Education (ref=no education)							
Primary	1.032	0.979	1.013	0.992	0.996	1.103*	0.892
Secondary	1.181***	1.030*	1.093**	0.996	1.031	1.138**	0.911
Higher	1.282***	1.352***	1.316***	1.123**	0.982	1.014	0.991
Occupation (ref=not working)							
Agricultural	na	1.002	1.01	1.012	1.015	0.994	0.986
Professional/technical/managerial		1.064	1.043	0.928	1.112	1.065	0.983
Clerical	na	1.144*	1.138	0.903	1.033	0.995	1.042
Sales	na	0.969	na	0.851*	1.043	1.053*	1.101
Services	na	0.967	1.025	0.976	1.035	1.068	1.073
Skilled manual	na	na	1.112	1.091	1.092*	1.080**	0.974
Unskilled manual	na	1.004	1.017	0.98	1.001	1.075	0.958
Other	na	1.057	0.654***	na	1.316*	0.458***	1.155
Household wealth quintile (ref=poorest)							
poorer	1.024	1.002	1.043	1.014	1.044	1.190***	1.061*
middle	1.039	1.006	1.008	0.962	1.055*	1.260***	1.123***
richer	1.035	1.008	1.052	1.003	1.087**	1.285***	1.253***
richest	1.066	1.072***	1.124**	1.017	1.612*	1.245***	1.367***
Religion							
Reference religion	Muslim	Hindu	Hindu	na	Buddhist	na	Roman Catholic
Muslim	na	0.930***	0.945	na	1.120	na	0.779***
Christian	1.078	0.973	na	na	0.829**	na	na
Buddhist	0.956	0.942	1.064*	na	na	na	na
Hindu	1.029	na	na	na	na	na	na
Other	na	0.994	1.144**	na	0.910	na	0.939
Protestant	na	na	na	na	na	na	1.084
Iglesia Ni Kristo	na	na	na	na	na	na	1.003
Aglipay	na	na	na	na	na	na	0.910
Sikh	na	1.006	na	na	na	na	na
Jain	na	0.909	na	na	na	na	na
Kirat	na	na	0.861**	na	na	na	na

Continued

Table 33—*Continued*

	South Asia				Southeast Asia		
	Bangladesh	**India**	**Nepal**	**Pakistan**	**Cambodia**	**Indonesia**	**Philippines**
Residence (ref=rural)							
urban	1.087***	1.023	1.051	0.958*	0.99	0.884***	0.986
Region (ref=region 1)							
Region 1	Dhaka	Uttar Pradesh	Terai	Punjab	Phnom Penh	Sumatera	National Capitol
Region 2	1.022	1.084***	0.981	1.095***	1.088	1.435***	0.916
Region 3	0.828***	1.086*	1.000	1.085***	1.033	1.044	0.964
Region 4	1.156***	1.184***		1.034	0.920	1.178***	0.984
Region 5	1.134**	1.088			1.002	0.961	0.95
Region 6	0.995	0.992			1.021	0.921*	0.93
Region 7	0.777***	1.231***			0.959		1.047
Region 8		0.995			0.963		0.867**
Region 9		0.940*			1.098		0.957
Region 10		0.948*			0.954		1.001
Region 11		1.039			0.917		0.93
Region 12		1.069**			1.128*		1.08
Region 13		1.201***			0.964		1.01
Region 14		0.996			1.087		1.087
Region 15		1.046			0.936		1.138*
Region 16		1.074*			1.012		0.984
Region 17		1.110*			0.929		1.135
Region 18		0.977			0.918		
Region 19		0.945			0.984		
Region 20		1.153***					
Region 21		0.942*					
Region 22		0.985					
Region 23		1.160***					
Region 24		1.128***					
Region 25		1.293***					
Region 26		1.291***					
Husband's education (ref=no education)							
Primary	1.014	0.994	0.994	1.03	0.967	1.041	0.918
Secondary	1.116***	1.008	1.024	1.047*	1.001	1.008	0.937
Higher	1.100**	1.055*	0.912	1.074*	1.012	0.904	0.987
Don't know	na	0.977	0.868	1.250*	0.633***	0.982	1.057
Husband's occupation (ref=agricultural)							
Professional/technical/managerial	na	1.0345	0.968	0.967	0.996	0.949	1.008
Clerical	na	1.0091	1.105**	0.936	1.122	0.936	1.087
Sales	na	0.9835	na	0.956	0.986	0.926**	1.224*
Services	na	1.0156	1.065*	1.004	1.071	0.959	1.031
Skilled manual	na	na	0.998	0.978	1.066**	0.989	0.988
Unskilled manual	na	1.015	1.041	1.003	0.938	0.861**	1.005
Other	na	1.069	1.049	0.905*	1.016	0.862	1.008
Not working	na	1.028	na	0.956	na	0.915	na
Constant	25.841*** (21.437 - 31.151)	21.603*** (20.088-23.232)	21.149*** (15.003 - 29.813)	22.419*** (19.948 - 25.197)	23.769*** (19.648 - 28.755)	18.930*** (15.954 - 22.461)	19.178*** (15.250-24.116)
Gamma (γ)	0.3710*** (0.363 - 0.379)	0.3317*** (0.327-0.337)	0.3115*** (0.302 - 0.321)	0.2965*** (0.288 - 0.305)	0.3389*** (0.330 - 0.348)	0.4186*** (0.411 - 0.426)	0.4099*** (0.400-0.420)

Continued

Table 33—*Continued*

	South Asia				Southeast Asia		
	Bangladesh	India	Nepal	Pakistan	Cambodia	Indonesia	Philippines
Weighted sample size (person-months)	603,029	2,873,777	271,254	288,645	391,788	1,678,620	312,180

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Shorter, medium, and longer first birth intervals roughly align with the average tercile among countries in the region. See Appendix Table 15.

Hazard models for Bangladesh excludes controls for: wife beating attitudes, occupation, and husband's occupation, as these data were not collected in the Bangladesh 2014 DHS.

India 2005-06 DHS (NFHS-3) does not distinguish between skilled manual and unskilled manual.

Hazard models for Indonesia and Pakistan exclude religious affiliation because these data were not collected in the Indonesia 2012 DHS or Pakistan 2012-13 DHS.

Indonesia 2012 DHS, Cambodia 2014 DHS, and Philippines 2013 DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India 2005-06 DHS (NFHS-3) and Indonesia 2012 DHS captures husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

Region names can be found in Appendix Table 5.

8.2. Effect of the First Birth Interval and Birth Cohort

Table 33 indicates that there is no statistically significant difference in the second birth interval depending on whether women experienced a shorter or a medium-length first birth interval in most countries. India is the exception, where women who experienced a medium-length first birth interval experience a longer second birth interval than do women who experienced a short first birth interval. However, in all countries but Nepal, women who experienced a longer first birth interval also experience a longer second birth interval compared to women experienced a shorter first birth interval. The effect appears to be of larger magnitude in Southeast Asia than in South Asia, although India and Cambodia do not reflect this pattern. The level of the effect ranges from Cambodia, where women with the longest tercile first interval experience a second interval that is 5% longer, to the Philippines where women in this tercile experience a second interval that is 20% longer.

Birth cohort is significantly and positively associated with the second birth cohort, such that women in successive birth cohorts experience longer second birth intervals, in all countries except India and Pakistan. The difference is greatest in Indonesia where women born between 1970-79 experience second birth intervals that are 33% longer and women born 1980-89 experience birth intervals that are 60% longer than do women born between 1960 and 1969.

8.3. Other Covariates

Gender Context

With one exception, women's decision-making and attitudes toward wife beating are not associated with the second birth interval. In Cambodia, women who reject wife beating in any of the listed scenarios have second birth intervals that are 5% longer, on average, than women who think that wife beating is acceptable in at least one scenario.

Spousal age difference is significantly associated with the second birth interval in three of seven study countries—Bangladesh, Cambodia, and Indonesia. However, the direction of this association is inconsistent. In Bangladesh and Indonesia, women experience a second birth interval that is 1% shorter with each additional year difference in age with their spouse. In Cambodia, second birth intervals are nearly 1% longer with each additional year difference in age between spouses.

Women's Socio-Demographic Characteristics

Women's education is significantly and positively associated with longer second birth intervals in all four South Asian countries. The effect is monotonically larger with increasing levels of education. In Southeast Asia, only Indonesia has a significant association between women's education and the second birth interval. Women who have a primary or secondary education have second birth intervals that are 10-14% longer than women with no education. There is no statistically significant difference with women with higher education.

Women's occupation is only sporadically associated with the second birth interval. In India, women who are working in professional and clerical occupations have longer second birth intervals than do women who are not working. The same is true of women working in skilled manual labor positions in Cambodia and Indonesia and sales positions in Indonesia.

Household wealth is associated with the second birth interval to a greater extent in Southeast Asia than in South Asia. In India and Nepal, only women who live in households in the richest wealth quintile have second birth intervals than women living in the poorest wealth quintile. In Indonesia, the Philippines, and Cambodia, the second birth interval lengthens monotonically with household wealth quintile.

Religious affiliation is infrequently associated with the second birth interval, with no apparent regional pattern. Christian women in Cambodia and Muslim women in the Philippines have shorter second birth intervals than the reference group (Buddhist and Catholic women, respectively). In Nepal, Buddhist women and women of other faiths have longer second birth intervals than do Hindu women, while Kirat women have shorter second birth intervals. In India, Muslim women have shorter second birth intervals than do Hindu women.

Women in living urban areas have longer second birth intervals than do rural women in Bangladesh, but shorter birth intervals in Pakistan and Indonesia. There are pervasive differences in the second birth interval by subnational region in Bangladesh, India, Indonesia, and Pakistan and intermittent differences in Cambodia and the Philippines.

Husband's Characteristics

There are weaker associations with husband's characteristics than with women's characteristics. There is positive association between husbands with secondary or higher education and longer second birth intervals in Bangladesh and Pakistan and with husbands with higher education in India. Women who do not know their husband's education level in Cambodia have shorter second birth intervals than women with no education; in Pakistan, these women have longer second birth intervals.

Husband's occupation is only sporadically associated with the second birth interval. Women who have longer second birth intervals (compared with women married to men working in agriculture) are those whose husbands working in clerical and services occupations in Nepal, skilled manual positions in Cambodia, and sales positions in the Philippines. In contrast, in Indonesia, women married to husbands in sales positions have shorter second birth intervals, as do Indonesian women with husbands in unskilled annual positions and those in "other" occupations in Pakistan.

9. Discussion and Conclusions

This study uses survival analysis, hazard models, and multivariate decomposition techniques to investigate the influence of marriage age on the first birth interval over time, and the implications of both marriage age and first birth interval for the second birth interval. Secondarily, attention is given to variables that describe the gender context. The study addresses these relationships in seven countries—four in South Asia and three in Southeast Asia—which have experienced significant change in either age at first birth or the first birth interval, or both in recent decades. The DHS data is used from two points in time over approximately a 10-year period to examine changes in these dynamics over time.

This study identified two distinct marriage patterns based on region: median completed age at marriage is low (during adolescent years) in South Asia and older in Southeast Asia. Similarly, the median completed age at first birth is lower—and the difference between median age at first birth and marriage is longer—in South Asia than in Southeast Asia.

However, time trends are not consistently contrasted between the two regions, nor are they consistent with region. Instead, the pace of change has been variable. Marriage age has increased rapidly in Indonesia, Nepal, and Bangladesh, but is slower elsewhere. The difference between the median completed age at marriage and first birth has remained steady in Pakistan, Cambodia, and the Philippines, but narrowed elsewhere.

The mean marriage age has increased significantly in all study countries. With this increase, the first birth interval[19] has become significantly shorter in four countries: Bangladesh, Nepal, Pakistan, and Indonesia. The decrease has been smaller in Pakistan and Indonesia. Meanwhile, the first birth interval has lengthened significantly in India and the Philippines while there has been no change in Cambodia.

This study examined trends in marriage age across a range of indicators that describe the gender context, women's socio-economic and socio-cultural milieu, and husband's characteristics. The study found universal increases in mean marriage age in South Asia (and Indonesia), across nearly all categories or levels of these indicators. However, marriage age increased at differential rates among these groups in these countries, while increases in marriage age are localized in Southeast Asia within groups where marriage age was already higher. This means that differentials in marriage age grew wider by most characteristics in most countries. Trends in Indonesia, both in marriage age overall and across subgroups of women, more closely resemble those observed in South Asia than in either Cambodia or the Philippines.

There is a significant change in the first birth interval over the (roughly) last year in every study country with the exception of Cambodia. While mean marriage age increased significantly in all countries, the first birth interval became significantly shorter, by 0.5-6.5 months, in Bangladesh, Nepal, Pakistan, and Indonesia. On the other hand, it increased significantly by 0.6 months in India and by 2.8 months in the Philippines.

In general, there has been more variation in the trends in the first birth interval across gender context, women's, and husband's characteristics than with trends in marriage age. Change in the first birth interval is observed to be more or less universal across subgroups of women in the South Asian countries in the study, according to women's decision-making, spousal age difference, household wealth quintile, subnational region, and both husband's education and occupation. Compared to changes in marriage age, change in the first birth interval is more often concentrated in specific groups of women according to

[19] As measured by the extended mean.

attitudes toward wife beating, education, occupation, religion, and place of residence. Change in the first birth interval is almost always localized in just a few select subgroups of women in Southeast Asia for all of the characteristics examined in the study. Indonesia again resembles the South Asian countries in trends of the first birth interval according to residence and region. Disparities in the first birth interval by spousal age difference, wealth, place of residence, and husband's education narrowed over time in most study countries, but increased or remained steady for other indicators.

Nearly all of the characteristics examined in this study are associated with marriage age in bivariate analyses in all study countries. The patterns of association are observed in South and Southeast Asian countries alike, with degree of difference in marriage age across a characteristic varying country-wise rather than regionally. Indicators describing a more gender equitable context (more women's decision-making, attitudes rejecting wife beating, and small spousal age difference) are associated with an older marriage age for all three variables, with women's decision-making appearing to be the least important among them. Women's education, employment in professional or clerical occupations, household wealth, and urban residence are positively associated with older marriage age in all study countries. Husband's education and, to a lesser extent, husband's occupation in professional positions are also associated with marrying later. Women who are not working or who work in agricultural occupations marry at younger ages, as do women married to husbands in agricultural occupations. Marriage age varies by subnational region and religion, but patterns are inconsistent across countries. This points to the significance of local context rather than broad regional patterns.

Differences in marriage age across these characteristics are usually small and sometimes non-significant (for example, women's decision-making, women's occupation, and religion) in Cambodia, whereas they are generally large in India and Indonesia (as with education, wealth, place of residence, and husband characteristics). Compared with marriage age, there are somewhat fewer associations between first birth intervals and the characteristics examined in this study.

This study finds a strong, consistent, negative association between marriage age and the hazard of the first birth interval in bivariate and multivariate analysis in six of the seven study countries, with the Philippines as the exception. However, the magnitude is modest with first birth intervals 2-6% shorter with each one year increase in age at marriage. This relationship is robust to the inclusion of controls, but declines to 1-2% shorter intervals with each year increase in age at marriage. A significant positive association between marriage age and the first birth interval emerges in the Philippines when controlling for other factors. Marriage age influences the first birth interval independent of the effect of birth cohort. The prominence of marriage age in explaining the first birth interval reinforces findings from previous studies (Westoff 1992).

Birth cohort also independently influences the first birth interval. Birth cohort has a negative association, in that the first birth interval declines over time even after controlling for increases in marriage age. This birth cohort effect reinforces the influence of marriage age on first birth intervals over time.

There is substantial variation across countries in other characteristics that are associated with the first birth interval in multivariate hazard models. Two indicators describing the gender context—spousal age difference and women's decision-making—are generally associated with the first birth interval in most South Asian countries, while attitudes toward wife beating are not. Women's decision-making is negatively related to the first birth interval, although not monotonically; there is a small increase with a longer first birth interval among women with the greatest decision-making capacity in some countries. This association loses significance when controlling for marriage age and other factors in Cambodia. Spousal age difference is curvilinearly associated with the first birth interval, in that intervals are longest among those with very little and very large age differences.

Women's education is associated with shorter first birth intervals in bivariate analysis, and retains this association in Pakistan and the Philippines with multivariate controls. However, education has a positive association with the first birth interval when accounting for marriage age and other controls.

Rural residence is associated with longer first birth intervals in India, Nepal, and Pakistan, whereas urban residence is in Bangladesh and Indonesia, even with age at marriage and other controls. There is no association in Cambodia or the Philippines, which suggests that urban residence is more salient in South Asia than Southeast Asia. The first birth interval varies by subnational region in three of five countries (India, Nepal, and the Philippines) after controlling for other factors, with regional differences greatest in India and smaller in Nepal. There is no such association in Bangladesh or Pakistan.

While bivariate analysis suggested that women who are not working or are employed in agricultural or unskilled manual labor occupations have shorter first birth intervals and those employed in professional and clerical occupations have longer first birth intervals, these associations are rarely observed when controlling for marriage age and other covariates. Associations with wealth and religion are similarly sporadic in multivariate analysis. Single-country studies elsewhere have found some of these factors to be associated with the first birth interval (Alam 2015; Dommaraju 2008; Rindfuss, Palmore, and Bumpass 1987). Attitudes toward wife beating and husband's characteristics (education and occupation) are infrequently associated with the first birth interval.

Decomposition analysis investigated whether first birth intervals changed over time because women marry at later ages or other characteristics changed (composition component), or whether the first birth interval changed because the rate these women are subject to has changed (effects component). The study finds no regional pattern in whether it is changes in composition, changes in rates, or both that drive the change in the first birth interval. Changes in the composition component contribute the majority of change in the first birth interval in Nepal and Pakistan in South Asia and Indonesia in Southeast Asia, whereas changes in the effects component contribute more to the overall change in Bangladesh and India in South Asia and the Philippines in Southeast Asia.

Both India and the Philippines experience significant change in the composition and effects components, in opposing directions. Changes in composition would imply shorter first birth intervals and changes in rates would imply longer first birth intervals; the net effect of these changes is a longer first birth interval over time.

The lack of significant change in first birth intervals in Cambodia could have been the net result of compositional and rate changes of equal magnitude operating in opposing directions. It is not. Cambodia has not experienced a significant change in either the overall composition or effects component, nor in the composition or effect of marriage age or any other constituent factors.

In detailed decomposition results, marriage age proves to be a significant influence on declines in first birth intervals in the six countries experience change in the first birth interval. That more women marry later than they did in the past accounts for 38-89% of the change in the first birth interval in the four South Asian countries and -10% of the change in Philippines and 86% of the change in Indonesia. The effect of marriage age has changed over time in India and Nepal, implying shorter first birth intervals at each age of marriage in India and longer first birth intervals at each age of marriage in Nepal. With these two exceptions, the effect of marriage age on the first birth interval has not changed over time.

Neither changes in the composition nor effect of the gender context variables contribute to change in the first birth interval. Changes (reductions) in the spousal age difference contribute modestly to longer first birth intervals in South Asia, but not in Southeast Asia.

The two countries where the first birth interval increased rather than decreased over time (the Philippines and India) manifest slightly different driving factors. In India, the contributions to a shorter first birth interval of more women marrying at older ages are amplified by a shorter first birth interval at all ages of marriage. However, the effect of these shifts in both composition and rate is reversed by cumulative changes in rates. Women in selected occupations, with secondary and higher education, and Hindu women, among others, experience longer first birth intervals than in the past, and this results in slightly longer first birth intervals overall.

In the Philippines, contributions to shorter first birth intervals of more women marrying at older ages than in the past are reversed by cumulative changes in rates over time for certain subgroups. Most notably, the first birth interval has become longer among Roman Catholics (contributing 345% to the change in the first birth interval), women with any education, women in the National Capital and two other regions, women who do not work, and those with husbands in professional occupations.

As with the first birth interval, marriage age is strongly significantly associated with the second birth interval, but the size of the effect is modest effect. Marriage age is associated with a 1.3-3.5% longer second birth interval in all seven countries. The effect is attenuated slightly when controls are added except in Pakistan, where the association is not significant. The result leads to the conclusion that marriage age influences not just the timing of the first birth, but also birth spacing, even after controlling for changes in birth cohort, the duration of the first birth interval, and other covariates.

The duration of the first birth interval is positively associated with second birth interval, except in Nepal. This influence is particularly strong for women with first birth intervals in the longest tercile. These women experience second birth intervals that are 5-20% longer than women whose first birth intervals fall in the shortest tercile. Similarly, women who were born in later birth cohorts experience longer second birth intervals than do women born 1960-69 in all countries except India and Pakistan.

In contrast, indicators that describe the gender context are poorly and inconsistently associated with longer second birth intervals, after marriage age, birth cohort, first birth interval, and other covariates are controlled. This finding would suggest that, to the extent that gender context influences birth spacing, it does so largely indirectly through these other factors. Husband's characteristics and women's place of residence are also inconsistently associated with the second birth interval. However, several socio-economic and socio-cultural indicators (education, wealth, and occasionally subnational region and religion) tend to be independently associated with the second birth interval, independent of other factors.

References

Abedin, S. 2011. “Identification of Fertility Enhancing and Inhibiting Factors: A Study on Married Adolescents in Bangladesh.” *Asian Social Science* 7(5):191.

Alam, M.M. 2015. “Marriage to First Birth Interval and Its Associated Factors in Bangladesh.” *Asian Journal of Social Sciences & Humanities Vol* 4:4.

Allison, P.D. 1995. *Survival Analysis Using SAS: A Practical Guide*. 10th printing ed. Cary, NC: SAS Institute Inc.

Amin, S., and A. Bajracharya. 2011a. *Costs of Marriage: Marriage Transactions in the Developing World.* Promoting Healthy, Safe, and Productive Transitions to Adulthood Brief No. 35. New York, NY: Population Council.

Amin, S., and A. Bajracharya. 2011b. *Marriage and First Birth Intervals in Early and Late Marrying Societies: An Exploration of Determinants*. In *Population Association of America*. Washington, DC.

Aryal, T.R. 2007. “Age at First Marriage in Nepal: Differentials and Determinants.” *Journal of Biosocial Science* 39(05):693-706.

Banerji, M., and R. Vanneman. 2011. “Does Love Make a Difference? Marriage Choice and Post-Marriage Decision-Making Power.” *Indian Human Developing Survey Working Paper No* 14.

Basu, A.M. 1993. “Cultural Influences on the Timing of First Births in India: Large Differences that Add Up to Little Difference.” *Population Studies* 47(1):85-95.

Bhattacharya, B.N., K.K. Singh, U. Singh, and C.M. Pandey. 1989. “An Extension of a Model for First Birth Interval and Some Social Factors.” *Sankhya: The Indian Journal of Statistics, Series B* 51(1):115-124.

Blinder, A.S. 1973. “Wage Discrimination: Reduced Form and Structural Estimates.” *Journal of Human Resources*:436-455.

Bloom, D.E., and P.H. Reddy. 1986. “Age Patterns of Women at Marriage, Cohabitation, and First Birth in India.” *Demography* 23(4):509-523.

Bongaarts, J. 1978. “A Framework for Analyzing the Proximate Determinants of Fertility.” *Population and Development Review* 4(1):105-132.

Bongaarts, J. 1999. “The Fertility Impact of Changes in the Timing of Childbearing in the Developing World.” *Population Studies* 53(3):277-289.

Bongaarts, J. 2015. “Modeling the Fertility Impact of the Proximate Determinants: Time for a Tune-Up.” *Demographic Research* 33:535.

Bongaarts, J., and B. Cohen. 1998. “Introduction and Overview.” *Studies in Family Planning* 29(2):99-105.

Box-Steffensmeier, J.M., and B.S. Jones. 2004. *Event History Modeling: A Guide for Social Scientists*. Cambridge: Cambridge University Press.

Chandra-Mouli, V., A.V. Camacho, and P.-A. Michaud. 2013. "WHO Guidelines on Preventing Early Pregnancy and Poor Reproductive Outcomes among Adolescents in Developing Countries " *Journal of Adolescent Health* 52(5):517-522.

Chandra-Mouli, V., C. Lane, and S. Wong. 2015. "What Does Not Work in Adolescent Sexual and Reproductive Health: A Review of Evidence on Interventions Commonly Accepted as Best Practices." *Global Health: Science and Practice* 3(3):333-340.

Choe, M.K., S. Thapa, and V. Mishra. 2005. "Early Marriage and Early Motherhood in Nepal." *Journal of Biosocial Science* 37(02):143-162.

Christensen, H.T. 1939. "The Time-Interval between Marriage of Parents and the Birth of Their First Child in Utah County, Utah." *The American Journal of Sociology* 44(4):518-525.

Christensen, H.T., and O.P. Bowden. 1952. "Studies in Child Spacing: The Time-Interval between Marriage of Parents and Birth of Their First Child, Tippecanoe County, Indiana." *Soc. F.* 31:346.

Cleves, M., R.G. Gutierrez, W. Gould, and Y.V. Marchenko. 2010. *An Introduction to Survival Analysis Using Stata*. Third ed. College Station, TX: Stata Press.

Coale, A.J. 1971. "Age Patterns of Marriage." *Population Studies* 25(2):193-214.

Coale, A.J. 1992. "Age of Entry into Marriage and the Date of the Initiation of Voluntary Birth Control." *Demography* 29(3):333-341.

Coale, A.J., and D.R. McNeil. 1972. "The Distribution by Age of the Frequency of First Marriage in a Female Cohort." *Journal of the American Statistical Association* 67(340):743-749.

Desai, S., and L. Andrist. 2010. "Gender Scripts and Age at Marriage in India." *Demography* 47(3):667-687.

Dommaraju, P. 2008. "Marriage Age and Fertility Dynamics in India." *DHS Working Paper* 52.

Donaldson, P.J., and D.J. Nichols. 1978. "The Changing Tempo of Fertility in Korea." *Population Studies* 32(2):231-249.

Dyson, T., and M. Moore. 1983. "On Kinship Structure, Female Autonomy, and Demographic Behavior in India." *Population and Development Review* 9(1):35-60.

Ertem, M., G. Saka, A. Ceylan, V. Değer, and S. Çiftçi. 2008. "The Factors Associated with Adolescent Marriages and Outcomes of Adolescent Pregnancies in Mardin Turkey." *Journal of Comparative Family Studies*:229-239.

Feng, W., and Y. Quanhe. 1996. "Age at Marriage and the First Birth Interval: The Emerging Change in Sexual Behavior among Young Couples in China." *Population and Development Review* 22(2):299-320.

Field, E., and A. Ambrus. 2008. "Early Marriage, Age of Menarche, and Female Schooling Attainment in Bangladesh." *Journal of Political Economy* 116(5):881-930.

Fricke, T., and J.D. Teachman. 1993. “Writing the Names: Marriage Style, Living Arrangements, and First Birth Interval in a Nepali Society.” *Demography* 30(2):175-188.

Ghimire, D.J. 2016. “Social Context of First Birth Timing in a Rapidly Changing Rural Setting.” *Social Science Research* In press.

Ghimire, D.J., and W.G. Axinn. 2013. “Marital Processes, Arranged Marriage, and Contraception to Limit Fertility.” *Demography* 50(5):1663-1686.

Godha, D., D.R. Hotchkiss, and A.J. Gage. 2013. “Association between Child Marriage and Reproductive Health Outcomes and Service Utilization: A Multi-Country Study from South Asia.” *Journal of Adolescent Health* 52(5):552-558.

Hindin, M.J., A.M. Kalamar, T.-A. Thompson, and U.D. Upadhyay. 2016. “Interventions to Prevent Unintended and Repeat Pregnancy among Young People in Low-and Middle-Income Countries: A Systematic Review of the Published and Gray Literature.” *Journal of Adolescent Health* 59(3):S8-S15.

Hirschman, C. 1985. “Premarital Socioeconomic Roles and the Timing of Family Formation: A Comparative Study of Five Asian Societies.” *Demography* 22(1):35-59.

Hirschman, C., and R. Rindfuss. 1980. “Social, Cultural and Economic Determinants of Age at Birth of First Child in Peninsular Malaysia.” *Population Studies* 34:507-518.

Hirschman, C., and R. Rindfuss. 1982. “The Sequence and Timing of Family Formation Events in Asia.” *American Sociological Review*:660-680.

Hong, Y. 2006. “Marital Decision-Making and the Timing of First Birth in Rural China before the 1990s.” *Population Studies* 60(3):329-341.

ICF International. 2015. *Questionnaires: Household, Woman's, and Man's, Demographic and Health Surveys Methodology*. Rockville, MD: ICF International.

Jensen, R., and R. Thornton. 2003. “Early Female Marriage in the Developing World.” *Gender & Development* 11(2):9-19.

Jones, G.W. 2007. “Delayed Marriage and Very Low Fertility in Pacific Asia.” *Population and Development Review* 33(3):453-478.

Jones, G.W. 2009. *Changing Marriage Patterns in Asia*. In *IUSSP*. Marrakech, Morocco.

Kalamar, A.M., S. Lee-Rife, and M.J. Hindin. 2016. “Interventions to Prevent Child Marriage among Young People in Low-and Middle-Income Countries: A Systematic Review of the Published and Gray Literature.” *Journal of Adolescent Health* 59(3):S16-S21.

Kallan, J., and J.R. Udry. 1986. “The Determinants of Effective Fecundability Based on the First Birth Interval.” *Demography* 23(1):53-66.

Kim, S.-Y., and W.F. Stinner. 1980. “Social Origins, Educational Attainment and the Timing of Marriage and First Birth among Korean Women.” *Journal of Marriage and the Family* 42(3):671-679.

Klugman, J., L. Hanmer, S. Twigg, T. Hasan, J. McCleary-Sills, and J. Santamaria. 2014. *Voice and Agency: Empowering Women and Girls for Shared Prosperity*: Washington, DC: World Bank Publications.

Lavely, W. 2007. "Sex, Breastfeeding and Marital Fertility in Pretransition China." *Population and Development Review* 33(2):289-320.

Lee-Rife, S., A. Malhotra, A. Warner, and A.M. Glinski. 2012. "What Works to Prevent Child Marriage: A Review of the Evidence." *Studies in Family Planning*:287-303.

Lloyd, C.B. 2005. *Growing up Global: The Changing Transition to Adulthood in Developing Countries*. Washington, D.C.: The National Academies Press.

Lloyd, C.B., and B. Mensch. 1999. "Implications of Formal Schooling for Girls' Transitions to Adulthood in Developing Countries." In Bledsoe, C.H., J.B. Casterline, J.A. Johnson-Kuhn, and J.G. Haaga, eds. *Critical Perspectives on Schooling and Fertility in the Developing World*. Pp 80-104. Washington, DC: National Academy Press.

Lloyd, C.B., and B.S. Mensch. 2008. "Marriage and Childbirth as Factors in Dropping out from School: An Analysis of DHS Data from Sub-Saharan Africa." *Population Studies* 62(1):1-13.

Loaiza Sr., E., and S. Wong. 2012. "Marrying Too Young. End Child Marriage." New York, NY: UNFPA.

Malhotra, A., and A.O. Tsui. 1996. "Marriage Timing in Sri Lanka: The Role of Modern Norms and Ideas." *Journal of Marriage and the Family*:476-490.

Malhotra, A., A. Warner, A. McGonagle, S. Lee-Rife, C. Powell, E.V. Cantrell, and R. Trasi. 2011. *Solutions to End Child Marriage: What the Evidence Shows*. Washington, DC: International Center for Research on Women.

Mason, W.M., and B. Entwisle. 1985. *Cross National Variability in Age at First Birth: Theory and Evidence.* Population Studies Center Report. University of Michigan Press.

Mensch, B., J. Bruce, and M. Greene. 1998. *The Unchartered Passage: Girls' Adolescence in the Developing World*. New York: Population Council.

Mensch, B.S., S. Singh, and J.B. Casterline. 2005. *Trends in the Timing of First Marriage among Men and Women in the Developing World*. Population Council Working Paper. New York, NY: Population Council.

Murphy, E., and D. Carr. 2009. *Powerful Partners. Adolescent Girls' Education and Delayed Childbearing.* Washington DC: Population Reference Bureau.

Nguyen, M.C., and Q. Wodon. 2012a. *Child Marriage, Pregnancies, and the Gender Gap in Education Attainment: An Analysis Based on the Reasons for Dropping out of School*. Washington, DC: The World Bank.

Nguyen, M.C., and Q. Wodon. 2012b. "Measuring Child Marriage." *Economics Bulletin* 32(1):398-411.

Nguyen, M.C., Q. Wodon, and Q. Wodon. 2015. “Impact of Child Marriage on Literacy and Education Attainment in Africa.” *Child Marriage and Education in Sub-Saharan Africa*. New York, NY: UNESCO and UNICEF.

Nour, N.M. 2009. “Child Marriage: A Silent Health and Human Rights Issue.” *Review of Obstetrics and Gynecology* 2(1):51-56.

Oaxaca, R. 1973. “Male-Female Wage Differentials in Urban Labor Markets.” *International Economic Review*:693-709.

Padmadas, S.S., I. Hutter, and F. Willekens. 2004. “Compression of Women's Reproductive Spans in Andhra Pradesh, India.” *International Family Planning Perspectives*:12-19.

Powers, D.A., H. Yoshioka, and M.-S. Yun. 2011. “Mvdcmp: Multivariate Decomposition for Nonlinear Response Models.” *Stata Journal* 11(4):556-576.

Powers, D.A., and M.S. Yun. 2009. “Multivariate Decomposition for Hazard Rate Models.” *Sociological Methodology* 39(1):233-263.

Raj, A. 2010. “When the Mother Is a Child: The Impact of Child Marriage on the Health and Human Rights of Girls.” *Archives of Disease in Childhood* 95(11): 931-935.

Raj, A., N. Saggurti, M. Winter, A. Labonte, M.R. Decker, D. Balaiah, and J.G. Silverman. 2010. “The Effect of Maternal Child Marriage on Morbidity and Mortality of Children under 5 in India: Cross Sectional Study of a Nationally Representative Sample.” *BMJ* 340:b4258.

Retherford, R.D., N. Ogawa, and R. Matsukura. 2001. “Late Marriage and Less Marriage in Japan.” *Population and Development Review* 27(1):65-102.

Rindfuss, R.R., and S.P. Morgan. 1983. “Marriage, Sex, and the First Birth Interval: The Quiet Revolution in Asia.” *Population and Development Review* 9(2):259-278.

Rindfuss, R.R., J.A. Palmore, and L.L. Bumpass. 1987. “Analyzing Birth Intervals: Implications for Demographic Theory and Data Collection.” *Sociological Forum* 2(4):811-828.

Rodriguez, G., and J. Trussell. 1980. “Maximum Likelihood Estimation of the Parameters of Coales Model Nuptiality Schedule from Survey Data.” *World Fertility Survey Technical Bulletin* 7.

Rutstein, S.O. 2008. *The DHSs Wealth Index: Approaches for Rural and Urban Areas, DHS Working Papers No. 60*. Calverton, MD: Macro International.

Rutstein, S.O., and K. Johnson. 2004. *The DHS Wealth Index, DHS Comparative Reports No. 6*. Calverton, MD: ORC Macro.

Rutstein, S.O., and G. Rojas. 2006. *Guide to DHS Statistics, Demographic and Health Surveys Methodology*. Calverton, MD: ICF International.

Santhya, K., U. Ram, R. Acharya, S.J. Jejeebhoy, F. Ram, and A. Singh. 2010. “Associations between Early Marriage and Young Women's Marital and Reproductive Health Outcomes: Evidence from India.” *International Perspectives on Sexual and Reproductive Health*:132-139.

Shrestha, D.P. 1998. “Socio-Economic Changes, Women’s Autonomy, and Timing of First Birth in a Semi-Urban Community in Nepal.” *Contributions to Nepalese Studies* 25:129-143.

Singh, A., and S. Becker. 2012. “Concordance between Partners in Desired Waiting Time to Birth for Newlyweds in India.” *Journal of Biosocial Science* 44(1):57-71.

Singh, S. 1998. “Adolescent Childbearing in Developing Countries: A Global Review.” *Studies in Family Planning*:117-136.

Speizer, I.S., and E. Pearson. 2011. “Association between Early Marriage and Intimate Partner Violence in India: A Focus on Youth from Bihar and Rajasthan.” *Journal of Interpersonal Violence* 26(10):1963-1981.

Tarone, R.E., and J. Ware. 1977. “On Distribution-Free Tests for Equality of Survival Distributions.” *Biometrika* 64(1):156-160.

Tian, F.F. 2013. “Transition to First Marriage in Reform-Era Urban China: The Persistent Effect of Education in a Period of Rapid Social Change.” *Population Research and Policy Review* 32(4):529-552.

Timaeus, I.M., and T.A. Moultrie. 2008. “On Postponement and Birth Intervals.” *Population and Development Review* 34(3):483-510.

Trussell, J., and D.E. Bloom. 1983. “Estimating the Co-Variates of Age at Marriage and First Birth.” *Population Studies* 37(3):403-416.

Trussell, J., J. Menken, and A.J. Coale. 1979. *A General Model for Analyzing the Effect of Nuptiality on Fertility*. Paper read at Nuptiality and fertility: proceedings of a seminar held in Bruges, at Liege, Belgium.

Trussell, J., and K. Reinis. 1989. “Age at Marriage and Age at First Birth.” *Population Bulletin of the United Nations*.

Tsui, A.O. 1982. “The Family Formation Process among U.S. Marriage Cohorts.” *Demography* 19(1):1-27.

UNICEF. 2005. *Early Marriage: A Harmful Traditional Practice: A Statistical Exploration*. New York, NY: UNICEF.

Vogelstein, R.B. 2013. *Ending Child Marriage: How Elevating the Status of Girls Advances US Foreign Policy Objectives*: Council on Foreign Relations.

Wachs, T.D. 2008. “Mechanisms Linking Parental Education and Stunting.” *The Lancet* 371(9609):280-281.

Westoff, C. 1992. *Age at Marriage, Age at First Birth, and Fertility in Africa*. World Bank Technical Paper No. 169. The World Bank: Washington, DC.

Wodon, Q., M.C. Nguyen, and C. Tsimpo. 2016. “Child Marriage, Education, and Agency in Uganda.” *Feminist Economics* 22(1):54-79.

Appendix Tables

Appendix Table 1. Observations for mean age at first marriage among ever-married women age 25-49

	Survey 1		Survey 2	
	year	weighted n	year	weighted n
Bangladesh	2004	7,457	2014	12,454
India	1998-99	64,739	2005-06	73,665
Nepal	2001	6,099	2011	7,279
Pakistan	2006-07	7,955	2012-13	10,601
Cambodia	2005	9,133	2014	10,485
Indonesia	2002-03	24,077	2012	30,059
Philippines	2003	7,377	2013	8,290

Appendix Table 2. Observations for hazard models predicting the first birth interval

	Total subjects	Failures among subjects	Analysis time units	Last observed exit
South Asia				
Bangladesh	12,514	12,160	429,097	422
India	72,693	69,319	2,276,662	483
Nepal	7,258	7,034	253,942	457
Pakistan	9,800	9,120	332,194	426
Southeast Asia				
Cambodia	10,284	9,770	272,768	422
Indonesia	28,955	27,372	731,959	472
Philippines	8,352	7,910	195,019	364

Appendix Table 3. Model diagnostics of the underlying hazard of the first birth interval

Model	Observations	Degrees of freedom	AIC	BIC
South Asia				
Bangladesh 2014				
exponential	388,624	25	33649.65	33921.41
weibull	388,624	26	33513.45	33796.08
ggamma	388,624	27	32687.24	32980.74
gompertz	388,624	26	32204.60	32487.23
lognormal	388,624	26	31781.07	32063.7
loglogistic	388,624	26	31116.42	31399.05
India 2005-06				
gompertz	2,029,150	66	228729.7	229556.3
lognormal	2,029,150	66	220245.8	221072.4
loglogistic	2,029,150	66	215279.8	216106.4
exponential	2,029,150	65	194353.0	195167.0
weibull	2,029,150	66	193250.6	194077.1
Nepal 2011				
gompertz	236,616	39	18600.94	19005.54
exponential	236,616	38	17982.10	18376.31
weibull	236,616	39	17168.00	17572.60
lognormal	236,616	39	16143.39	16547.99
ggamma	236,616	38	15688.39	16082.61
loglogistic	236,616	39	15631.39	16035.99

Continued

Appendix Table 3—*Continued*

Model	Observations	Degrees of freedom	AIC	BIC
Pakistan 2012-13				
gompertz	308,190	38	34986.11	35390.37
lognormal	308,190	38	34329.57	34733.83
loglogistic	308,190	38	33552.04	33956.30
exponential	308,190	37	29939.09	30332.71
weibull	308,190	38	29930.92	30335.18
ggamma	308,190	39	28664.39	29079.29
Southeast Asia				
Cambodia 2014				
gompertz	236,931	56	24470.07	25051.1
exponential	236,931	55	24038.84	24609.49
weibull	236,931	56	23174.29	23755.32
lognormal	236,931	56	20246.95	20827.97
ggamma	236,931	57	19568.98	20160.39
loglogistic	236,931	56	19203.31	19784.34
Indonesia 2012				
gompertz	663,139	41	86996.45	87464.04
lognormal	663,139	41	78326.18	78793.78
exponential	663,139	40	77469.09	77925.28
weibull	663,139	41	77023.72	77491.32
loglogistic	663,139	41	75637.12	76104.71
ggamma	663,139	42	66418.39	66897.39
Philippines 2013				
exponential	178,255	55	22151.98	22706.98
weibull	178,255	56	22138.82	22703.91
gompertz	178,255	56	20731.96	21297.06
ggamma	178,255	57	19365.84	19941.02
lognormal	178,255	56	18913.64	19478.74
loglogistic	178,255	56	18336.47	18901.56

Notes:

Full hazard models for Bangladesh exclude controls for: wife beating attitudes, occupation, and husband's occupation as these data were not collected in the Bangladesh 2014 DHS

India 2005-06 DHS (NFHS-3) does not distinguish between skilled manual and unskilled manual.

Full hazard models for Indonesia and Pakistan exclude religious affiliation as these data were not collected in the Indonesia 2012 DHS or Pakistan 2012-13 DHS.

Indonesia 2012 DHS, Cambodia 2014 DHS, and Philippines 2013 DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India 2005-06 DHS (NFHS-3) and Indonesia 2012 DHS captures husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

Appendix Table 4. Country-specific religion categories and coefficients (time ratios) from adjusted loglogistic hazard models of the marriage to first birth interval

Bangladesh		India		Nepal		Cambodia		Philippines	
Ref=Muslim		Ref=Hindu		Ref=Hindu		Ref=Buddhist		Ref=Roman Catholic	
Hinduism	0.998	Muslim	0.885***	Buddhist	0.973	Muslim	0.924	Protestant	1.045
Buddhism	1.009	Christian	0.898***	Muslim	1.054	Christian	0.947	Iglesia Ni Kristo	0.888*
Christianity	0.649	Sikh	0.937	Kirat	0.929	Other	0.947	Aglipay	0.820*
		Buddhist/ neo-Buddhist	1.011	Other	1.031			Muslim	1.126*
		Jain	0.900					Other	0.976
		Other	1.109						

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Hazard models for most surveys control for: age at marriage, birth cohort, decision-making ability, wife beating attitudes, spousal age difference, education, occupation, household wealth quintile, rural/urban residence, region of country, husband's education, and husband's occupation

Hazard models for Bangladesh excludes controls for: wife beating attitudes, occupation, and husband's occupation as these data were not collected in the Bangladesh 2014 DHS

Hazard models for Indonesia and Pakistan exclude religious affiliation as these data were not collected in the Indonesia 2012 DHS or Pakistan 2012-13 DHS.

Appendix Table 5. Country-specific regional categories and coefficients (time ratios) from adjusted loglogistic hazard models of the marriage to first birth interval

Region #	Bangladesh		India		Nepal		Pakistan		Cambodia		Indonesia		Philippines	
Region 1	Ref=Dhaka		Ref=Uttar Pradesh and Uttaranchal		Ref=terai		Ref=Punjab		Ref=Phnom Penh		Ref=Sumatera		Ref=National Capital	
Region 2	Barisal	0.979	Andhra Pradesh	1.199***	mountain	1.102*	Sindh	1.059	Banteay Mean Chey	0.936	Java	1.121***	Cordillera	0.865*
Region 3	Chittagong	0.881***	Arunachal Pradesh	0.967	hill	0.983	Khyber Pakhtunkwa	0.985	Kampong Cham	0.939	Bali & Nusa Tenggara	0.961*	I - Ilocos	0.915
Region 4	Khulna	1.028	Assam	0.899**			Balochistan	1.039	Kampong Chhnang	1.117*	Kalimantan	1.045**	II – Cagayan Valley	0.933
Region 5	Rajshahi	0.961	Bihar & Jharkhand	1.023					Kampong Speu	0.993	Sulawesi	1.014	III - Central Luzon	0.928
Region 6	Rangpur	0.964	Delhi	1.045					Kampong Thom	1.058	Maluku & Papua	1.044	IVA - Calabarzon	0.869**
Region 7	Sylhet	0.918	Goa	1.166***					Kandal	1.068			IVB - Mimaropa	0.928
Region 8			Gujarat	1.130***					Kratie	1.255***			V - Bicol	0.898*
Region 9			Haryana	1.138***					Prey veng	1.191***			VI – Western Visayas	0.894*
Region 10			Himachal Pradesh	0.898***					Pursat	0.963			VII – Central Visayas	0.883*
Region 11			Jammu & Kashmir	0.851***					Siem reap	1.022			VIII - Eastern Visayas	0.941
Region 12			Karnataka	0.909***					Svay rieng	1.144**			IX - Zambo-anga Peninsula	0.939
Region 13			Kerala	0.923***					Takeo	1.095			X – Northern Mindanao	0.986
Region 14			Madhya Pradesh	1.099***					Otdar Mean Chey	0.993			XI - Davao	0.946
Region 15			Mahara-shtra	0.977					Battam-bang & Pailin	1.06			XII - Socc-skargen	0.911
Region 16			Manipur	0.874***					Kampot & Kep	1.112*			XIII - Caraga	1
Region 17			Meghalaya	0.98					Preah Sihanouk & Kaoh Kong	1.026			ARMM	1.119
Region 18			Mizoram	0.815***					Preah Vihear & Steung Treng	1.007				
Region 19			Nagaland	0.959					Mondol Kiri & Ratta-nak Kiri	1.021				
Region 20			Orissa	0.962										
Region 21			Punjab	1.013										
Region 22			Rajasthan	1.307***										
Region 23			Sikkim	0.977										
Region 24			Tamil Nadu	0.907***										
Region 25			Tripura	1.026										
Region 26			West Bengal	0.866***										

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Hazard models for most surveys control for: age at marriage, birth cohort, decision-making ability, wife beating attitudes, spousal age difference, education, occupation, household wealth quintile, rural/urban residence, region of country, husband's education, and husband's occupation

Hazard model for Bangladesh excludes controls for: wife beating attitudes, occupation, and husband's occupation as these data were not collected in the Bangladesh 2014 DHS

Hazard models for Indonesia and Pakistan exclude religious affiliation as these data were not collected in the Indonesia 2012 DHS or Pakistan 2012-13 DHS.

Appendix Table 6. Comparison of β coefficients from linear regression models and loglogistic accelerated failure-time hazard models predicting duration of the first birth interval (Discrepancies in direction or significance highlighted in red)

	Bangladesh		India		Nepal		Pakistan		Cambodia		Indonesia		Philippines	
	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β
Age at first cohabitation in years	-1.89*** (-2.14 - -1.63)	-0.05*** (-0.06 - -0.04)	-1.94*** (-2.04 - -1.84)	-0.04*** (-0.05 - -0.04)	-2.57*** (-2.93 - -2.21)	-0.06*** (-0.07 - -0.05)	-1.41*** (-1.66 - -1.16)	-0.02*** (-0.03 - -0.01)	-0.97*** (-1.13 - -0.81)	-0.02*** (-0.03 - -0.02)	-1.04*** (-1.19 - -0.89)	-0.01*** (-0.02 - -0.01)	-0.49*** (-0.64 - -0.34)	0.01** (0.00 - 0.01)
Birth cohort (ref=1960-69)														
1950-59	na	na	4.57*** (3.31 - 5.83)	0.12*** (0.09 - 0.16)	na	na	na	na	na	na	na	na	na	na
1970-79	-6.82*** (-9.36 - -4.28)	-0.21*** (-0.28 - -0.14)	-3.89*** (-4.49 - -3.28)	-0.09*** (-0.11 - -0.07)	-8.29*** (-10.41 - -6.18)	-0.22*** (-0.27 - -0.16)	-3.50** (-5.79 - -1.21)	-0.04 (-0.11 - 0.03)	-2.57** (-4.43 - -0.70)	-0.07** (-0.12 - -0.02)	-1.54* (-2.75 - -0.33)	-0.03 (-0.07 - 0.00)	-1.13 (-2.55 - 0.28)	0.03 (-0.02 - 0.08)
1980-89	-13.94*** (-16.30 - -11.58)	-0.40*** (-0.47 - -0.33)	-7.24*** (-8.14 - -6.33)	-0.11*** (-0.14 - -0.07)	-13.31*** (-15.83 - -10.79)	-0.34*** (-0.40 - -0.27)	-9.79*** (-12.02 - -7.55)	-0.16*** (-0.23 - -0.09)	-4.75*** (-6.44 - -3.07)	-0.11*** (-0.16 - -0.06)	-4.82*** (-6.05 - -3.60)	-0.05** (-0.09 - -0.01)	-4.26*** (-5.79 - -2.73)	-0.03 (-0.09 - 0.02)
Decisionmaking														
number of decisions in which Respondent is involved	0.25 (-0.90 - 1.41)	0.01 (-0.02 - 0.03)	-0.64*** (-0.90 - -0.38)	-0.02*** (-0.03 - -0.01)	-1.56*** (-2.25 - -0.87)	-0.04*** (-0.06 - -0.02)	0.24*** (0.14 - 0.34)	0.01*** (0.01 - 0.01)	-1.01* (-2.01 - -0.02)	-0.03 (-0.06 - 0.00)	-0.58* (-1.13 - -0.03)	-0.01 (-0.02 - 0.01)	-0.61 (-1.53 - 0.30)	-0.01 (-0.04 - 0.02)
Wife beating attitudes (ref=wife beating is acceptable in at least one scenario														
Respondent rejects wife beating in any scenario	na na	na na	-0.01 (-0.61 - 0.58)	-0.01 (-0.03 - 0.01)	-4.28 (-13.00 - 4.43)	-0.09 (-0.42 - 0.24)	1.44 (-0.10 - 2.98)	0.03 (-0.02 - 0.09)	0.72 (-0.54 - 1.98)	0.01 (-0.03 - 0.04)	0.02 (-0.91 - 0.95)	-0.01 (-0.04 - 0.02)	-0.15 (-1.52 - 1.22)	-0.01 (-0.06 - 0.04)
Spousal age difference in years	-0.41*** (-0.61 - -0.20)	-0.01*** (-0.02 - -0.01)	-0.38*** (-0.46 - -0.31)	-0.01*** (-0.01 - -0.01)	-0.06 (-0.25 - 0.14)	0 (-0.00 - 0.00)	-0.17 (-0.34 - 0.00)	0 (-0.01 - 0.00)	0.05 (-0.19 - 0.29)	0 (-0.00 - 0.01)	-0.07 (-0.21 - 0.07)	0 (-0.00 - 0.01)	0.04 (-0.08 - 0.16)	0.01*** (0.01 - 0.01)
Education (ref=no education)														
Primary	-1.63 (-3.70 - 0.44)	-0.01 (-0.08 - 0.05)	-0.03 (-0.90 - 0.84)	0.01 (-0.02 - 0.04)	0.07 (-2.49 - 2.62)	-0.04 (-0.10 - 0.01)	-0.63 (-3.12 - 1.86)	-0.02 (-0.10 - 0.05)	1.61* (0.06 - 3.16)	0.04 (-0.00 - 0.09)	0.26 (-3.07 - 3.58)	0 (-0.09 - 0.09)	-2.21 (-6.99 - 2.57)	-0.1 (-0.24 - 0.05)
Secondary	1.8 (-0.37 - 3.96)	0.14*** (0.06 - 0.22)	1.12* (0.25 - 1.99)	0.08*** (0.05 - 0.10)	-0.79 (-2.97 - 1.39)	-0.05 (-0.12 - 0.01)	-1.14 (-3.76 - 1.48)	-0.07 (-0.14 - 0.01)	0.98 (-0.82 - 2.79)	0.03 (-0.03 - 0.09)	-0.65 (-4.11 - 2.82)	-0.09 (-0.19 - 0.01)	-3.4 (-8.16 - 1.35)	-0.19** (-0.34 - -0.05)
Higher	10.10*** (6.74 - 13.45)	0.47*** (0.35 - 0.59)	4.99*** (3.64 - 6.34)	0.22*** (0.17 - 0.26)	6.62*** (3.06 - 10.18)	0.22*** (0.09 - 0.34)	0.34 (-2.73 - 3.41)	-0.10* (-0.20 - -0.01)	0.97 (-2.66 - 4.59)	0.03 (-0.11 - 0.17)	1.79 (-2.15 - 5.74)	-0.05 (-0.16 - 0.06)	-3.33 (-8.24 - 1.59)	-0.24** (-0.40 - -0.09)

Continued

Appendix Table 6—*Continued*

	Bangladesh		India		Nepal		Pakistan		Cambodia		Indonesia		Philippines	
	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β
Occupation (ref=not working)														
	na	na	-1.75***	-0.05***	-3.73**	-0.10**	-3.42	-0.13	-0.27	0.00	-0.13	0.00	-2.49**	-0.01
Agricultural	na	na	(-2.64 - -0.86)	(-0.08 - -0.02)	(-6.40 - -1.06)	(-0.17 - -0.03)	(-7.33 - 0.49)	(-0.30 - 0.04)	(-1.67 - 1.12)	(-0.05 - 0.05)	(-1.82 - 1.55)	(-0.05 - 0.05)	(-4.05 - -0.92)	(-0.08 - 0.05)
	na	na	0.91	0.06*	-3.65*	-0.17*	1.85	0.11	1.01	0.05	0.51	0.04	-3.01***	-0.06
Professional/technical/managerial	na	na	(-0.44 - 2.26)	(0.01 - 0.10)	(-7.07 - -0.24)	(-0.29 - -0.04)	(-3.01 - 6.71)	(-0.05 - 0.28)	(-1.68 - 3.70)	(-0.06 - 0.15)	(-1.76 - 2.78)	(-0.01 - 0.09)	(-4.51 - -1.51)	(-0.12 - 0.01)
	na	na	2.93*	0.12**	-5.13	-0.2	-15.58***	0.13	-0.75	0.03	2.84*	0.11**	-3.75**	-0.06
Clerical	na	na	(0.05 - 5.80)	(0.05 - 0.20)	(-15.01 - 4.76)	(-0.55 - 0.15)	(-21.54 - -9.63)	(-0.90 - 1.16)	(-4.76 - 3.26)	(-0.17 - 0.23)	(0.18 - 5.51)	(0.04 - 0.17)	(-6.05 - -1.46)	(-0.17 - 0.05)
	na	na	-0.52	-0.04	na	na	-1.14	0.01	-0.66	-0.02	0.05	0.02	-0.87	0.04
Sales	na	na	(-2.56 - 1.52)	(-0.11 - 0.02)	na	na	(-3.88 - 1.60)	(-0.09 - 0.10)	(-2.16 - 0.84)	(-0.07 - 0.04)	(-1.07 - 1.17)	(-0.01 - 0.05)	(-3.25 - 1.51)	(-0.06 - 0.14)
	na	na	-3.13***	-0.13***	-3.93**	-0.14***	1.01	0.03	0.76	0.06	0.45	0.01	-3.30*	-0.08
Services	na	na	(-4.61 - -1.64)	(-0.17 - -0.08)	(-6.53 - -1.33)	(-0.22 - -0.06)	(-6.33 - 8.35)	(-0.22 - 0.29)	(-1.94 - 3.46)	(-0.03 - 0.15)	(-1.55 - 2.45)	(-0.05 - 0.07)	(-5.91 - -0.69)	(-0.17 - 0.02)
	na	na	-1.76***	-0.04*	-2.87	-0.06	-1.45	-0.01	-0.11	0	-0.45	0.02	-3.90**	-0.10*
Skilled manual	na	na	(-2.73 - -0.78)	(-0.08 - -0.01)	(-6.94 - 1.20)	(-0.20 - 0.08)	(-4.42 - 1.51)	(-0.12 - 0.09)	(-1.91 - 1.70)	(-0.07 - 0.06)	(-1.77 - 0.87)	(-0.02 - 0.06)	(-6.23 - -1.56)	(-0.20 - -0.00)
	na	na	na	na	-3.96	-0.08	1.8	0.05	0.2	0.02	-2.45	-0.04	-2.80***	-0.07**
Unskilled manual	na	na	na	na	(-10.24 - 2.31)	(-0.21 - 0.05)	(-11.71 - 15.31)	(-0.40 - 0.50)	(-4.60 - 5.01)	(-0.15 - 0.18)	(-5.49 - 0.59)	(-0.14 - 0.05)	(-4.26 - -1.34)	(-0.12 - -0.02)
	na	na	-0.3	0.03	-12.83**	-0.08	na	na	-0.09	0.27*	26.43*	1.34**	-2.19	0.14
Other	na	na	(-7.98 - 7.39)	(-0.26 - 0.31)	(-21.70 - -3.96)	(-0.70 - 0.53)	na	na	(-4.23 - 4.04)	(0.01 - 0.53)	(2.17 - 50.69)	(0.37 - 2.30)	(-11.78 - 7.41)	(-0.46 - 0.74)
Household wealth quintile (ref=poorest)														
	0.56	0	-1.43**	-0.04*	-0.08	0.03	-4.30*	-0.08	-1.33	-0.04	-1.31	-0.01	-1.70*	-0.06*
poorer	(-2.88 - 4.00)	(-0.08 - 0.09)	(-2.46 - -0.41)	(-0.07 - -0.00)	(-2.50 - 2.33)	(-0.04 - 0.09)	(-8.16 - -0.43)	(-0.22 - 0.06)	(-3.25 - 0.60)	(-0.09 - 0.02)	(-3.00 - 0.37)	(-0.06 - 0.04)	(-3.11 - -0.29)	(-0.11 - -0.01)
	-1.74	-0.01	-1.35*	-0.04*	-2.23	-0.02	-5.63*	-0.17*	-1.34	-0.02	-2.98***	-0.03	-0.53	-0.02
middle	(-4.00 - 0.52)	(-0.10 - 0.07)	(-2.45 - -0.25)	(-0.08 - -0.00)	(-5.61 - 1.16)	(-0.11 - 0.07)	(-10.06 - -1.20)	(-0.33 - -0.02)	(-3.38 - 0.70)	(-0.08 - 0.03)	(-4.75 - -1.21)	(-0.08 - 0.02)	(-2.09 - 1.03)	(-0.08 - 0.04)
	-0.6	0.01	-2.55***	-0.06**	-7.13***	-0.12*	-7.99***	-0.22**	-0.94	0	-2.98**	-0.03	-0.21	0.02
richer	(-2.83 - 1.62)	(-0.07 - 0.09)	(-3.72 - -1.39)	(-0.10 - -0.02)	(-10.60 - -3.65)	(-0.21 - -0.03)	(-12.66 - -3.33)	(-0.38 - -0.06)	(-3.01 - 1.13)	(-0.06 - 0.06)	(-4.90 - -1.07)	(-0.08 - 0.02)	(-2.13 - 1.70)	(-0.05 - 0.10)
	-1.9	0	-2.67***	-0.08***	-6.61***	-0.09	-10.89***	-0.27**	-0.84	-0.04	-3.79***	-0.06*	1.06	0.01
richest	(-4.58 - 0.77)	(-0.09 - 0.09)	(-4.04 - -1.30)	(-0.12 - -0.04)	(-10.38 - -2.84)	(-0.20 - 0.01)	(-15.93 - -5.86)	(-0.45 - -0.10)	(-3.17 - 1.49)	(-0.10 - 0.03)	(-5.74 - -1.84)	(-0.11 - -0.00)	(-1.06 - 3.18)	(-0.07 - 0.10)

Continued

Appendix Table 6—*Continued*

	Bangladesh		India		Nepal		Pakistan		Cambodia		Indonesia		Philippines	
	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β
Religion														
Reference religion	Muslim		Hindu		Hindu				Buddhist				Catholic	
Muslim			-3.40*** (-4.37 - -2.44)	-0.12*** (-0.16 - -0.09)	1.24 (-5.53 - 8.00)	0.05 (-0.11 - 0.22)	na	na	-4.95** (-8.53 - -1.36)	-0.08 (-0.22 - 0.06)	na	na	3.30* (0.52 - 6.08)	0.12* (0.03 - 0.22)
Christian	-9.71*** (-14.70 - -4.72)	-0.43 (-0.94 - 0.07)	-2.13** (-3.60 - -0.66)	-0.11*** (-0.16 - -0.06)	-0.65 (-3.70 - 2.40)	-0.03 (-0.10 - 0.05)	na	na	-1.4 (-9.30 - 6.50)	-0.06 (-0.25 - 0.14)	na	na	na	na
Buddhist	2.51 (-0.74 - 5.76)	0.01 (-0.12 - 0.14)	-0.58 (-4.79 - 3.63)	0.01 (-0.16 - 0.18)	1.63 (-2.96 - 6.22)	0.03 (-0.11 - 0.17)	na	na	-0.63 (-4.86 - 3.60)	-0.05 (-0.22 - 0.12)	na	na	na	na
Hindu	0.63 (-0.97 - 2.23)	0 (-0.07 - 0.06)					na	na	na	na	na	na	na	na
Other	na	na	3.62 (-6.19 - 13.44)	0.1 (-0.17 - 0.37)	na	na	na	na	na	na	na	na	na	na
Protestant	na	na	na	na	na	na	na	na	na	na	na	na	-1.43 (-3.09 - 0.24)	-0.03 (-0.09 - 0.04)
Iglesia Ni Kristo	na	na	na	na	na	na	na	na	na	na	na	na	-0.24 (-2.46 - 1.97)	0.04 (-0.04 - 0.13)
Aglipay	na	na	na	na	na	na	na	na	na	na	na	na	-2.92* (-5.33 - -0.50)	-0.12* (-0.23 - -0.01)
Sikh	na	na	na	na	na	na	na	na	na	na	na	na	-5.04*** (-7.36 - -2.72)	-0.20* (-0.37 - -0.03)
Jain	na	na	-1.51 (-3.39 - 0.36)	-0.07 (-0.14 - 0.01)	na	na	na	na	na	na	na	na	na	na
Kirat	na	na	-1.86 (-5.24 - 1.52)	-0.11 (-0.21 - 0.00)	na	na	na	na	na	na	na	na	na	na
	na	na	na	na	-0.73 (-5.90 - 4.43)	-0.07 (-0.21 - 0.06)	na	na	na	na	na	na	na	na
Residence (ref=rural)														
urban	1.72* (0.24 - 3.19)	0.07** (0.02 - 0.12)	-0.99** (-1.74 --0.24)	-0.05*** (-0.08 --0.02)	-0.78 (-2.59 - 1.03)	-0.04 (-0.09 - 0.02)	-2.21 (-4.49 - 0.06)	-0.09* (-0.16 --0.01)	1.28 (-0.22 - 2.77)	0.06* (0.00 - 0.11)	-1.61** (-2.61 - 0.60)	-0.07*** (-0.11 --0.04)	-0.79 (-2.01 - 0.43)	-0.01 (-0.06 - 0.04)

Continued

Appendix Table 6—*Continued*

	Bangladesh		India		Nepal		Pakistan		Cambodia		Indonesia		Philippines	
	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β
Region (ref=region 1)														
Region 1	Dhaka		Uttar Pradesh & Uttaranchal		terai		Punjab		Phnom Penh		Sumatera		National Capital	
Region 2	-1.14 (-3.43 - 1.16)	-0.02 (-0.10 - 0.06)	3.19*** (1.62 - 4.75)	0.18*** (0.13 - 0.23)	2.82 (-0.98 - 6.62)	0.10* (0.01 - 0.19)	1.17 (-1.43 - 3.77)	0.06 (-0.02 - 0.14)	0.78 (-2.37 - 3.93)	-0.07 (-0.20 - 0.07)	3.43*** (2.45 - 4.41)	0.11*** (0.08 - 0.14)	-2.29 (-5.11 - 0.54)	-0.14* (-0.27 - -0.02)
Region 3	-3.06** (-4.97 - -1.15)	-0.13*** (-0.20 - -0.06)	0.56 (-1.99 - 3.10)	-0.03 (-0.11 - 0.05)	-0.54 (-2.83 - 1.74)	-0.02 (-0.07 - 0.04)	0.66 (-1.99 - 3.31)	-0.01 (-0.09 - 0.07)	0.72 (-1.97 - 3.40)	-0.06 (-0.16 - 0.03)	0.52 (-0.59 - 1.64)	-0.04* (-0.08 - -0.00)	-2.2 (-4.95 - 0.54)	-0.09 (-0.20 - 0.02)
Region 4	-0.19 (-2.36 - 1.98)	0.03 (-0.04 - 0.09)	-2.10** (-3.67 - -0.52)	-0.11** (-0.18 - -0.03)			1.78 (-3.00 - 6.56)	0.04 (-0.11 - 0.18)	2.17 (-0.14 - 4.48)	0.11* (0.02 - 0.20)	0.9 (-0.18 - 1.97)	0.04** (0.01 - 0.08)	-1.57 (-4.21 - 1.08)	-0.07 (-0.18 - 0.04)
Region 5	-1.77 (-4.15 - 0.62)	-0.04 (-0.11 - 0.04)	0.81 (-0.77 - 2.39)	0.02 (-0.03 - 0.08)					0.47 (-1.72 - 2.65)	-0.01 (-0.10 - 0.09)	0.22 (-0.84 - 1.28)	0.01 (-0.02 - 0.05)	-2.25* (-4.43 - -0.06)	-0.08 (-0.16 - 0.01)
Region 6	-2.2 (-4.74 - 0.35)	-0.04 (-0.12 - 0.05)	0.94 (-0.60 - 2.47)	0.04 (-0.01 - 0.10)					1.78 (-0.54 - 4.10)	0.06 (-0.03 - 0.15)	1.68 (-0.42 - 3.78)	0.04 (-0.04 - 0.12)	-3.56*** (-5.58 - -1.55)	-0.14** (-0.22 - -0.05)
Region 7	-1 (-3.45 - 1.45)	-0.09 (-0.18 - 0.01)	4.53*** (2.89 - 6.18)	0.15*** (0.10 - 0.21)					1.71 (-0.40 - 3.81)	0.07 (-0.03 - 0.16)			-1.97 (-4.71 - 0.77)	-0.07 (-0.19 - 0.04)
Region 8			1.68* (0.06 - 3.30)	0.12*** (0.07 - 0.17)					7.35*** (4.22 - 10.47)	0.23*** (0.13 - 0.32)			-2.69* (-5.26 - -0.12)	-0.11* (-0.21 - -0.00)
Region 9			2.21** (0.62 - 3.81)	0.13*** (0.07 - 0.18)					5.49*** (2.88 - 8.09)	0.17*** (0.08 - 0.27)			-2.18 (-4.57 - 0.22)	-0.11* (-0.22 - -0.01)
Region 10			-3.52*** (-4.97 - -2.06)	-0.11*** (-0.17 - -0.05)					1.61 (-0.98 - 4.19)	-0.04 (-0.13 - 0.06)			-3.31** (-5.58 - -1.05)	-0.12* (-0.23 - -0.01)
Region 11			-2.70*** (-4.19 - -1.20)	-0.16*** (-0.23 - -0.09)					0.34 (-1.67 - 2.36)	0.02 (-0.06 - 0.11)			-2.47 (-5.30 - 0.37)	-0.06 (-0.17 - 0.05)
Region 12			-1.76* (-3.13 - -0.38)	-0.10*** (-0.14 - -0.05)					4.62*** (2.12 - 7.11)	0.13** (0.04 - 0.23)			-2.85* (-5.38 - -0.31)	-0.06 (-0.18 - 0.05)
Region 13			-1.70* (-3.00 - -0.40)	-0.08*** (-0.13 - -0.03)					5.14*** (2.31 - 7.98)	0.09 (-0.01 - 0.19)			-0.1 (-3.48 - 3.27)	-0.01 (-0.11 - 0.08)
Region 14			0.6 (-0.72 - 1.93)	0.09*** (0.05 - 0.14)					4.07* (0.16 - 7.98)	-0.01 (-0.14 - 0.13)			-1.2 (-4.17 - 1.78)	-0.06 (-0.17 - 0.06)
Region 15			-1.06 (-2.35 - 0.22)	-0.02 (-0.07 - 0.02)					2.07 (-0.72 - 4.86)	0.06 (-0.04 - 0.16)			-2.68 (-5.37 - 0.01)	-0.09 (-0.20 - 0.01)
Region 16			-2.14** (-3.44 - -0.84)	-0.14*** (-0.18 - -0.09)					3.90** (1.25 - 6.55)	0.11* (0.00 - 0.21)			-0.67 (-3.76 - 2.43)	0 (-0.10 - 0.09)

Continued

Appendix Table 6—*Continued*

	Bangladesh		India		Nepal		Pakistan		Cambodia		Indonesia		Philippines	
	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β
Region 17			-2.04 (-4.10 - 0.01)	-0.02 (-0.09 - 0.05)					2.26 (-0.24 - 4.76)	0.03 (-0.06 - 0.11)			-0.01 (-3.53 - 3.50)	0.11 (-0.01 - 0.24)
Region 18			-3.53** (-5.84 - -1.22)	-0.20*** (-0.28 - -0.12)					1.74 (-0.77 - 4.24)	0.01 (-0.09 - 0.10)				
Region 19			-1.56 (-3.42 - 0.29)	-0.04 (-0.11 - 0.02)					1.32 (-1.24 - 3.87)	0.02 (-0.09 - 0.13)				
Region 20			-0.78 (-2.48 - 0.92)	-0.04 (-0.10 - 0.02)										
Region 21			-0.65 (-2.39 - 1.08)	0.01 (-0.05 - 0.08)										
Region 22			5.26*** (3.53 - 6.98)	0.27*** (0.21 - 0.32)										
Region 23			-0.97 (-2.94 - 1.01)	-0.02 (-0.10 - 0.05)										
Region 24			-2.31*** (-3.67 - -0.95)	-0.10*** (-0.15 - -0.05)										
Region 25			-1.21 (-2.93 - 0.51)	0.03 (-0.03 - 0.08)										
Region 26			-3.99*** (-5.40 - -2.58)	-0.14*** (-0.20 - -0.08)										
Husband's education (ref=no education)	(-1.39 - 0.40)	(-0.03 - 0.02)												
Primary	-3.01** (-5.13 - -0.88)	-0.10** (-0.16 - -0.03)	0.49 (-0.36 - 1.34)	0.02 (-0.01 - 0.05)	-2.26 (-5.35 - 0.83)	-0.03 (-0.09 - 0.04)	-0.28 (-2.71 - 2.15)	0.05 (-0.04 - 0.14)	-0.14 (-2.27 - 2.00)	-0.01 (-0.07 - 0.05)	-2.91 (-6.66 - 0.84)	-0.08 (-0.19 - 0.04)	-2.08 (-6.67 - 2.51)	-0.01 (-0.16 - 0.13)
Secondary	-1.32 (-3.12 - 0.48)	-0.03 (-0.10 - 0.04)	1.63* (0.36 - 2.90)	0.07** (0.03 - 0.11)	-0.99 (-3.95 - 1.97)	-0.02 (-0.10 - 0.06)	0.61 (-1.90 - 3.12)	0.04 (-0.05 - 0.12)	-0.25 (-2.46 - 1.96)	-0.02 (-0.08 - 0.04)	-3.37 (-7.18 - 0.43)	-0.11 (-0.23 - 0.01)	-1.43 (-6.06 - 3.21)	-0.03 (-0.18 - 0.12)
Higher	3.05* (0.59 - 5.51)	0.11* (0.02 - 0.19)	0.27 (-3.47 - 4.01)	-0.01 (-0.16 - 0.13)	-0.53 (-4.04 - 2.97)	-0.01 (-0.10 - 0.09)	1.7 (-1.24 - 4.65)	0.09 (-0.02 - 0.20)	-0.1 (-3.42 - 3.22)	-0.02 (-0.13 - 0.09)	-2.51 (-6.61 - 1.59)	-0.08 (-0.21 - 0.04)	-1.8 (-6.54 - 2.93)	-0.06 (-0.22 - 0.09)
Don't know	na	na	na	na	-3.36 (-13.45 - 6.73)	-0.09 (-0.35 - 0.18)	-0.79 (-13.94 - 12.35)	0.22 (-0.35 - 0.78)	4.88 (-4.55 - 14.32)	0.38 (-0.06 - 0.81)	19.28 (-4.59 - 43.15)	0.31 (-0.34 - 0.96)	-9.66** (-16.58 - 2.74)	-0.41** (-0.72 --0.10)

Continued

Appendix Table 6—*Continued*

	Bangladesh		India		Nepal		Pakistan		Cambodia		Indonesia		Philippines	
	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β	Linear Regression β	Loglogistic Hazard β
Husband's occupation (ref=agricultural)														
Professional/technical/ managerial			0.72 (-0.53 - 1.96)	0.01 (-0.03 - 0.04)	-0.99 (-4.17 - 2.19)	-0.03 (-0.12 - 0.05)			-1.23 (-3.37 - 0.91)	-0.04 (-0.11 - 0.03)	-0.58 (-2.36 - 1.20)	-0.09*** (-0.14 - -0.04)	1.99* (0.12 - 3.87)	0.08* (0.01 - 0.16)
Clerical			0.42 (-0.90 - 1.75)	0.01 (-0.03 - 0.05)	2.04 (-0.82 - 4.91)	0.06 (-0.01 - 0.13)	3.74* (0.73 - 6.76)	0.11 (-0.00 - 0.22)	-2.99* (-5.88 - -0.09)	-0.06 (-0.19 - 0.07)	0.11 (-1.89 - 2.12)	-0.05 (-0.12 - 0.01)	-0.55 (-3.90 - 2.79)	-0.06 (-0.20 - 0.07)
Sales			-0.58 (-1.58 - 0.43)	-0.02 (-0.05 - 0.01)	na na	na na	1.44 (-3.53 - 6.41)	-0.01 (-0.16 - 0.14)	-0.43 (-2.88 - 2.02)	-0.07* (-0.14 - -0.00)	1.48 (-0.26 - 3.22)	0 (-0.05 - 0.05)	3.63 (-0.88 - 8.14)	0.09 (-0.09 - 0.26)
Services			1.2 (-0.19 - 2.59)	0.04 (-0.00 - 0.08)	1.09 (-1.56 - 3.74)	0.04 (-0.02 - 0.10)	1.89 (-0.82 - 4.60)	0.02 (-0.08 - 0.12)	-0.47 (-2.62 - 1.67)	0 (-0.08 - 0.08)	-1.1 (-2.75 - 0.55)	-0.08** (-0.14 - -0.03)	0.39 (-1.56 - 2.34)	0.07 (-0.02 - 0.15)
Skilled manual			na na	na na	-1.64 (-4.29 - 1.01)	-0.03 (-0.11 - 0.05)	3.90** (1.16 - 6.65)	0.08 (-0.01 - 0.18)	1.16 (-0.38 - 2.69)	0.01 (-0.03 - 0.06)	0.26 (-1.12 - 1.63)	-0.03 (-0.07 - 0.01)	0.89 (-0.41 - 2.19)	0.05 (-0.00 - 0.10)
Unskilled manual			0.36 (-0.48 - 1.19)	0 (-0.03 - 0.03)	-0.3 (-3.07 - 2.48)	0 (-0.07 - 0.07)	2.02 (-0.36 - 4.39)	0.03 (-0.06 - 0.12)	-2.36 (-6.01 - 1.30)	-0.06 (-0.22 - 0.10)	-1.43 (-3.13 - 0.26)	-0.06 (-0.13 - 0.00)	1.28 (-0.34 - 2.89)	0.03 (-0.03 - 0.08)
Other			7.61* (0.30 - 14.92)	0.16 (-0.04 - 0.36)	1.52 (-3.55 - 6.59)	0.07 (-0.06 - 0.20)	1.23 (-1.38 - 3.85)	0 (-0.09 - 0.09)	2.01 (-3.29 - 7.30)	0 (-0.14 - 0.14)	-1.15 (-4.49 - 2.20)	-0.05 (-0.17 - 0.06)	3.55 (-0.62 - 7.72)	0.18 (-0.03 - 0.39)
Not working			-0.56 (-2.47 - 1.36)	0.01 (-0.05 - 0.08)	na na	na na	-1.13 (-5.58 - 3.32)	-0.02 (-0.22 - 0.17)	na na	na na	-2.95 (-12.50 - 6.61)	0.09 (-0.52 - 0.71)	na na	na na
Weighted sample size (person-months)	11,273	381,297	65,486	2,231,385	6,754	240,034	9,323	342,734	8,930	239,300	26,492	716,796	7,191	175,005

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Model for Bangladesh excludes controls for: wife beating attitudes, occupation, and husband's occupation as these data were not collected in the Bangladesh 2014 DHS

India 2005-06 DHS (NFHS-3) does not distinguish between skilled manual and unskilled manual.

Models for Indonesia and Pakistan exclude religious affiliation as these data were not collected in the Indonesia 2012 DHS or Pakistan 2012-13 DHS.

Indonesia 2012 DHS, Cambodia 2014 DHS, and Philippines 2013 DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India 2005-06 DHS (NFHS-3) and Indonesia 2012 DHS captures husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

Regions listed in Appendix Table 4.

Appendix Table 7. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of women's socio-demographic variables: Education

		Composition component			Effects component		
	n	β		Percent	β		Percent
South Asia							
Bangladesh 2004-2014	20,017						
No education		-0.11		2.34	0.07		-1.53
Primary		-0.04	***	0.83	-0.30		6.66
Secondary		-0.37	***	8.12	0.14		-3.17
Higher		0.15	***	-3.35	0.00		-0.01
India 1998/99-2005/06	139,267						
No education		0.02		1.82	-0.72	***	-73.37
Primary		0.02	***	1.86	-0.06		-6.47
Secondary		-0.07	***	-7.23	0.13		13.19
Higher		-0.04	***	-3.91	0.09		9.46
Nepal 2001-2011	13,385						
No education		-0.33		6.12	-0.10		1.91
Primary		-0.04		0.83	0.09		-1.65
Secondary		-0.44	***	8.24	0.07		-1.34
Higher		0.12	**	-2.31	-0.02		0.28
Pakistan 2006-2013	17,685						
No education		-0.14	*	17.81	0.54		-66.83
Primary		0.00		0.15	-0.08		9.76
Secondary		-0.04	*	5.33	0.03		-3.49
Higher		-0.01		1.49	-0.03		3.88
Southeast Asia							
Cambodia 2005-2014	19,455						
No education		0.02		-141.18	0.86		-6565.10
Primary		-0.03		237.45	3.07		-23314.00
Secondary		0.00		10.05	0.97		-7352.90
Higher		-0.01		100.16	-0.08		634.91
Indonesia 2002-2012	52,999						
No education		-0.04		2.40	-0.13		9.17
Primary		-0.04		2.59	0.51		-34.71
Secondary		-0.20	***	13.68	0.08		-5.25
Higher		0.03		-1.81	0.02		-1.56
Philippines 2003-2013	17,685						
No education		-0.01		-0.99	-0.07		-10.58
Primary		-0.03		-4.58	0.56		81.55
Secondary		-0.10	*	-14.11	0.35		51.32
Higher		-0.03	*	-4.65	0.34		49.26

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Appendix Table 8. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of women's socio-demographic variables: Occupation

		Composition component			Effects component		
	n	β		Percent	β		Percent
South Asia							
India 1998/99-2005/06	139,267						
Not working		-0.02		-1.87	0.45		45.81
Agricultural		-0.03	*	-3.44	0.24		25.06
Professional/technical/ managerial		0.01	*	0.73	-0.02		-2.49
Clerical		0.01	**	0.83	-0.01		-0.64
Sales		0.00		0.04	0.02		2.13
Services		-0.08	***	-8.20	0.00		-0.16
Unskilled manual		0.00	*	-0.26	-0.06		-6.10
Other		0.00		0.10	0.00		0.06
Nepal 2001-2011	13,385						
Not working		0.34	***	-6.33	-0.17		3.18
Agricultural		-0.32		6.08	-0.63		11.86
Professional/technical/ managerial		0.01		-0.11	0.02		-0.36
Clerical		0.00		0.05	0.03		-0.56
Sales		na		na	na		na
Services		0.12		-2.20	0.03		-0.51
Skilled manual		0.01		-0.18	-0.03		0.63
Unskilled manual		0.01		-0.19	-0.04		0.66
Other		0.29		-5.52	-0.35		6.52
Pakistan 2006-2013	17,685						
Not working		-0.01		1.14	1.57		-196.44
Agricultural		0.03		-3.36	-0.15		19.14
Professional/technical/ managerial		0.00		0.02	0.08		-10.53
Clerical		0.00	***	-0.25	-0.01	*	1.06
Sales		0.00		-0.45	0.01		-0.64
Services		-0.01		0.78	0.19		-23.87
Skilled manual		0.03		-4.03	0.05		-6.09
Unskilled manual		0.02		-1.99	-0.01		1.66

Continued

Appendix Table 8—*Continued*

	n	Composition component β		Composition component Percent	Effects component β		Effects component Percent
Southeast Asia							
Cambodia 2005-2014	19,455						
Not working		-0.04		308.56	-0.07		523.01
Agricultural		-0.01		38.30	2.49		-18931.00
Professional/technical/ managerial		0.02		-166.02	0.20		-1548.00
Clerical		0.00		-11.60	0.03		-245.42
Sales		0.04		-270.49	0.51		-3885.40
Services		0.02		-125.27	-0.11		800.64
Skilled manual		-0.08		632.37	-0.04		273.98
Unskilled manual		-0.09		666.30	0.90		-6850.70
Other		0.00		1.62	0.03		-218.33
Indonesia 2002-2012	52,999						
Not working		0.33	*	-22.74	-1.39		94.76
Agricultural		0.30		-20.15	-1.01		68.57
Professional/technical/ managerial		-0.06		4.35	-0.19		13.11
Clerical		0.00		0.08	-0.04		2.87
Sales		-0.10		6.77	-0.33		22.46
Services		-0.03		2.14	-0.20	*	13.34
Skilled manual		-0.33	*	22.32	-0.17		11.66
Unskilled manual		-0.10	***	7.13	0.00		0.01
Other		-0.01		0.48	0.01		-0.72
Philippines 2003-2013	15,783						
Not working		-0.15	**	-21.82	0.31		44.84
Agricultural		0.01		1.41	0.06		8.97
Professional/technical/ managerial		-0.02		-3.10	-0.14		-21.24
Clerical		0.00		0.44	-0.07		-10.33
Sales		-0.14		-21.06	0.15		21.55
Services		-0.01		-0.88	0.03		4.78
Skilled manual		0.01		0.88	-0.11		-16.09
Unskilled manual		-0.01		-1.94	-0.02		-2.73
Other		0.00		-0.12	0.00		0.50

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Appendix Table 9. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of women's socio-demographic variables: Household wealth quintile

		Composition component			Effects component		
	n	β		Percent	β		Percent
South Asia							
Bangladesh 2004-2014	20,017						
Poorest		0.00		-0.10	-0.28		6.18
Poorer		-0.01		0.22	-0.14		3.03
Middle		-0.01		0.21	-0.07		1.49
Richer		0.00		0.09	0.41		-8.91
Richest		0.00		0.02	0.13		-2.85
India 1998/99-2005/06	139,267						
Poorest		-0.01		-0.59	0.01		1.21
Poorer		0.00		0.05	-0.16		-16.26
Middle		0.00		0.01	0.00		-0.10
Richer		0.00	*	-0.33	0.05		5.51
Richest		0.00		0.08	0.12		12.67
Nepal 2001-2011	**13,385**						
Poorest		-0.06		1.17	-0.02		0.38
Poorer		-0.01	*	0.16	0.20		-3.68
Middle		0.01		-0.27	0.25		-4.65
Richer		-0.03	***	0.59	-0.67	*	12.60
Richest		-0.04		0.67	0.23		-4.28
Pakistan 2006-2013	17,685						
Poorest		-0.02	***	3.12	0.48		-59.58
Poorer		0.00		0.08	0.14		-17.57
Middle		0.00		0.01	-0.20		25.03
Richer		0.00	*	0.03	-0.44		54.86
Richest		-0.01	***	1.44	-0.04		5.10
Southeast Asia							
Cambodia 2005-2014	19,455						
Poorest		0.00		37.16	0.01		-60.55
Poorer		0.00		13.32	-0.43		3264.40
Middle		-0.01		42.06	0.07		-500.51
Richer		0.00		16.21	-0.07		545.34
Richest		0.00		-27.22	0.42		-3194.70
Indonesia 2002-2012	52,999						
Poorest		-0.05	***	3.49	0.15		-10.06
Poorer		0.00		0.07	0.02		-1.13
Middle		-0.01		0.47	-0.15		10.33
Richer		-0.01		0.77	0.11		-7.46
Richest		0.00	*	0.21	-0.13		8.92
Philippines 2003-2013	15,783						
Poorest		0.00		-0.66	-0.06		-8.50
Poorer		0.03	***	3.70	-0.35	**	-51.95
Middle		0.00		0.17	0.08		11.68
Richer		0.00		0.15	0.15		21.74
Richest		0.00	**	0.03	0.21		30.50

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Appendix Table 10. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of women's socio-demographic variables: Religion quintile

		Composition component			Effects component		
	n	β		Percent	β		Percent
South Asia							
Bangladesh 2004-2014	20,017						
Muslim		0.00		0.04	-0.20		4.43
Christian		0.05	*	-1.09	-0.05		1.10
Buddhist		0.05		-1.07	0.00		-0.07
Hindu		-0.02		0.36	0.23		-5.15
India 1998/99-2005/06	139,267						
Muslim		-0.02	***	-1.70	-0.11		-11.09
Christian		0.00		0.06	0.01		1.29
Buddhist		0.00		0.03	0.02		1.74
Hindu		0.00	***	0.07	0.36		36.60
Other		0.00		0.07	-0.01		-0.64
Sikh		0.00		0.00	0.00		-0.22
Jain		0.00		0.04	0.00		-0.13
Nepal 2001-2011	13,385						
Muslim		0.00		0.00	-0.28		5.30
Christian							
Buddhist		-0.01		0.10	0.07		-1.38
Hindu		0.00		0.00	-0.75		14.00
Other		-0.01		0.21	0.02		-0.42
Kirat		-0.01		0.20	0.04		-0.67
Southeast Asia							
Cambodia 2005-2014	19,455						
Muslim		-0.01		55.64	-0.02		122.08
Christian		0.00		-16.40	0.01		-49.92
Buddhist		0.01		-45.07	-2.46		18676.00
Other		0.00		-12.84	0.02		-152.59
Philippines 2003-2013	15,783						
Other		-0.01		-1.31	-0.01		-1.12
Roman Catholilc		-0.03	*	-4.04	2.35	***	345.01
Protestant		-0.01		-0.76	0.14		20.34
Iglesia Ni Kristo		0.00		0.72	-0.02		-3.17
Aglipay		0.03	***	4.63	-0.10	***	-14.77

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Appendix Table 11. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of women's socio-demographic variables: Place of residence

		Composition component			Effects component	
	n	β		Percent	β	Percent
South Asia						
Bangladesh 2004-2014	20,017					
rural		0.04		-0.80	0.08	-1.80
urban		0.04		-0.82	-0.27	5.93
India 1998/99-2005/06	139,267					
rural		-0.02	***	-2.54	-0.04	-3.76
urban		-0.02	***	-2.25	0.09	9.45
Nepal 2001-2011	13,385					
rural		-0.02		0.32	0.02	-0.30
urban		-0.02		0.31	-0.14	2.70
Pakistan 2006-2013	17,685					
rural		-0.01	*	0.83	-0.32	40.23
urban		-0.01	*	1.08	0.60	-75.50
Southeast Asia						
Cambodia 2005-2014	19,455					
rural		0.00		-7.11	0.16	-1212.40
urban		-0.01		58.45	-0.83	6275.00
Indonesia 2002-2012	52,999					
rural		-0.02	***	1.66	-0.21	14.27
urban		-0.03	***	1.75	0.23	-15.93
Philippines 2003-2013	15,783					
rural		0.02		3.07	-0.28	-41.73
urban		0.02		2.89	0.25	36.10

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Appendix Table 12. Detailed multivariate decomposition of changes in the interval to first birth, showing contributions to the change attributed to differences in composition and to differences in effects of women's socio-demographic variables: Subnational region

		Composition component			Effects component		
	n	β		Percent	β		Percent
South Asia							
Bangladesh 2004-2014	20,017						
Dhaka		0.02		-0.41	0.51		-11.20
Barisal		0.00		0.05	-0.02		0.43
Chittagong		-0.01	***	0.20	-0.07		1.57
Khulna		-0.02	*	0.36	0.30	*	-6.51
Rajshahi & Rangpur		0.01		-0.26	-0.28		6.22
Sylhet		0.00		0.03	-0.14		3.03
India 1998/99-2005/06	139,267						
Uttar Pradesh & Uttaranchal		0.00		0.50	-0.83	***	-85.28
Andhra Pradesh		0.27	***	27.34	0.01	***	0.61
Arunachal Pradesh		-0.02		-1.77	-0.31	***	-31.88
Assam		0.00	**	-0.19	0.04	*	4.39
Bihar & Jharkhand		0.00	**	0.35	-0.10		-10.54
Delhi		0.00	**	-0.23	0.02		1.89
Goa		0.00	***	0.01	0.00		0.09
Gujarat		0.01	***	0.67	0.03		3.53
Haryana		0.00	***	-0.29	0.03		3.26
Himachal Pradesh		0.00	***	0.02	-0.01		-0.90
Jammu & Kashmir		0.00	**	0.00	-0.02	*	-1.79
Karnataka		-0.01	*	-0.58	0.03		3.04
Kerala		0.00		0.48	-0.02		-1.61
Madhya Pradesh & Chattisgarh		0.01	***	1.31	-0.09		-9.31
Maharashtra		0.00		0.09	-0.11		-11.19
Manipur		0.00	***	0.02	0.00	*	0.34
Meghalaya		0.00	***	0.09	0.01	**	0.56
Mizoram		0.00	***	0.01	0.00		0.03
Nagaland		0.00	***	0.06	0.00		0.31
Orissa		0.00		0.01	0.00		0.34
Punjab		0.00		0.08	0.06	*	5.73
Rajasthan		0.01	***	0.63	-0.04		-4.45
Sikkim		0.00		0.01	0.00		0.04
Tamil Nadu		0.02	***	1.73	-0.08		-7.69
Tripura		0.00		0.00	0.00		0.15
West Bengal		0.00	***	0.28	-0.38	***	-39.40
Nepal 2001-2011	13,385						
Terai		-0.03		0.48	1.22	*	-22.92
Mountain		-0.01	***	0.23	-0.12		2.24
Hill		0.01		-0.27	-0.29		5.44
Pakistan 2006-2013	17,685						
Punjab		0.00		-0.61	0.73		-91.56
Sindh		0.00		-0.35	0.02		-2.21
Khyber Pakhtunkwa		0.00		0.05	0.40	**	-49.94
Balochistan		0.00		0.04	-0.20	***	25.28

Continued

Appendix Table 12—*Continued*

	n	Composition component			Effects component		
		β		Percent	β		Percent
Southeast Asia							
Cambodia 2005-2014	19,455						
Phnom Penh		0.01		-55.95	-0.13		964.46
Banteay Mean Chey		0.00		18.33	-0.14		1080.50
Kampong Cham		0.00		15.81	-0.01		49.37
Kampong Chhnang		0.00		-2.36	-0.07		539.89
Kampong Speu		-0.05		375.97	-0.23		1747.70
Kampong Thom		0.00		17.46	0.03		-207.89
Kandal		0.01		-88.21	-0.12		900.56
Kratie		0.04		-320.27	0.10		-734.78
Prey Veng		-0.04		329.95	0.14		-1065.50
Pursat		-0.01		93.70	0.11		-810.82
Siem Reap		0.02		-122.98	0.06		-446.22
Svay Rieng		0.00		-5.54	0.02		-145.50
Takeo		-0.04		312.73	0.26		-1991.00
Otdar Mean Chey		0.01		-58.62	0.08		-576.45
Battambang & Pailin		0.00		36.59	-0.21		1592.90
Kampot & Kep		-0.01		48.65	0.00		9.88
Preah Sihanouk & Kaoh Kong		0.00		-3.77	-0.04		341.64
Preah Vihear & Steung Treng		0.00		-3.94	0.04		-272.99
Mondol Kiri & Rattanak Kiri		-0.01		64.37	-0.10		755.20
Indonesia 2002-2012	52,999						
Sumatera		0.00	***	-0.31	-0.29	*	19.91
Java		-0.04	***	2.84	-0.01		0.63
Bali & Nusa Tenggara		0.00		0.19	0.11	**	-7.41
Kalimantan		0.00		0.00	-0.03		1.88
Sulawesi		-0.01		0.43	-0.02		1.16
Maluku & Papua		0.00	***	-0.31	-0.29	*	19.91
Philippines 2003-2013	15,783						
National Capital		-0.01		-1.09	0.16		22.78
Cordillera		0.00		0.03	-0.03		-4.43
I - Ilocos		0.00		0.06	0.01		1.19
II - Cagayan Valley		0.00		0.05	0.02		3.24
III - Central Luzon		0.00		0.08	0.04		5.25
IVA - Calabarzon		-0.02	*	-2.59	-0.19		-27.20
IVB - Mimaropa		0.00		0.04	0.00		-0.30
V - Bicol		0.00		0.08	-0.05		-6.83
VI - Western Visayas		0.00		0.01	0.04		5.23
VII - Central Visayas		0.02	*	3.30	-0.14		-20.02
VIII - Eastern Visayas		0.00		0.20	-0.11		-15.47
IX - Zamboanga Peninsula		-0.01		-1.10	-0.14	*	-20.13
X - Northern Mindanao		0.00		0.08	0.12		18.29
XI - Davao		0.00		0.30	0.11		16.87
XII - Soccskargen		0.00		-0.44	0.06		8.67
XIII - Caraga		0.00		0.62	0.06		8.78
ARMM		-0.01		-1.20	0.03		4.63

Notes:

*** p≤0.001; ** p≤0.01; * p≤0.05

Decomposition models are estimated with the following covariates: marriage age, women's decision-making (except India and Pakistan), attitudes toward wife beating (except Bangladesh, India, and Pakistan), spousal age difference, education, occupation (except Bangladesh), household wealth quintile, religion (except Pakistan and Indonesia), residence, subnational region, husband's education, and husband's occupation (except Bangladesh).

Appendix Table 13. Observations for hazard models predicting the second birth interval

	Total subjects	Failures among subjects	Analysis time units	Last observed exit	dropped
South Asia					
Bangladesh	12,083	10,614	675,450	417	77
India	68,933	60,823	2,873,777	413	386
Nepal	6,990	6,288	288,677	391	44
Pakistan	9,052	8,270	290,566	381	68
Southeast Asia					
Cambodia	9,710	8,120	450,916	437	60
Indonesia	27,206	21,623	1,605,630	385	166
Philippines	7,871	6,632	345,895	354	39

Appendix Table 14. Model diagnostics of the underlying hazard of the second birth interval

Model	Observations	Degrees of freedom	AIC	BIC
South Asia				
Bangladesh 2014				
exponential	11,226	27	27376.31	27574.11
weibull	11,226	28	25148.41	25353.54
ggamma	11,226	29	21734.75	21947.21
gompertz	11,226	28	27087.63	27292.76
lognormal	11,226	28	22021.14	22226.27
loglogistic	11,226	28	21864.10	22069.23
Nepal 2011				
exponential	270,391	40	15696.40	16116.70
weibull	270,391	41	13585.48	14016.29
ggamma	270,391	42	10782.44	11223.76
gompertz	270,391	41	15572.59	16003.40
lognormal	270,391	41	11453.29	11884.10
loglogistic	270,391	41	11253.95	11684.76
Pakistan 2012-13				
exponential	270,466	38	21709.57	22108.87
weibull	270,466	39	19336.59	19746.40
ggamma	270,466	40	13627.78	14048.09
gompertz	270,466	39	25140.15	25549.96
lognormal	270,466	39	18571.61	18981.42
loglogistic	270,466	39	17942.46	18352.27
Southeast Asia				
Cambodia 2014				
exponential	384,057	57	20757.30	21376.24
weibull	384,057	58	18702.13	19331.93
ggamma	384,057	59	15202.11	15842.76
gompertz	384,057	58	21694.92	22324.71
lognormal	384,057	58	16937.03	17566.83
loglogistic	384,057	58	16698.47	17328.26
Philippines 2013				
exponential	312,246	57	18012.64	18619.78
weibull	312,246	58	17356.15	17973.94
ggamma	312,246	59	14004.83	14633.28
gompertz	312,246	58	17994.16	18611.95
lognormal	312,246	58	15124.84	15742.63
loglogistic	312,246	58	15036.36	15654.15

Notes:

Full hazard models for Bangladesh exclude controls for: wife beating attitudes, occupation, and husband's occupation as these data were not collected in the Bangladesh 2014 DHS

India 2005-06 DHS (NFHS-3) does not distinguish between skilled manual and unskilled manual.

Full hazard models for Indonesia and Pakistan exclude religious afiliation as these data were not collected in the Indonesia 2012 DHS or Pakistan 2012-13 DHS.

Indonesia 2012 DHS, Cambodia 2014 DHS, and Philippines 2013 DHS do not collect data on husband's current employment status, but categorizes husband's occupation regardless of current employment status.

India 2005-06 DHS (NFHS-3) and Indonesia 2012 DHS captures husband's current employment status as a separate occupational category and categorizes husband's occupation only for husbands who are currently working.

Appendix Table 15. Tercile survival times to first birth in months, ever-married women age 25-49

	25th percentile	50th percentile (median)	75th percentile
South Asia			
Bangladesh	13	24	42
India	13	20	36
Nepal	15	24	41
Pakistan	12	21	40
Southeast Asia			
Cambodia	13	19	29
Indonesia	11	15	26
Philippines	10	14	24