Factors Contributing to Fertility Decline in Nepal

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Abstract

While the fertility transition in Nepal started in the 1980s, the decline was rather modest until the early 1990s. Nepal witnessed a sustained decline in fertility, falling from 5.1 children per woman in 1991 to 4.6 in 1996 and 4.1 in 2001, with a further drop to 3.1 in 2006 and 2.6 in 2011. Reduction of fertility by half in two decades (from 5.1 in 1991 to 2.6 in 2011) and by one child per woman in five years (4.1 in 2001 to 3.1 in 2006) is a remarkable achievement. Fertility in urban areas has reached an ultra-low level of 1.6 as compared with 2.8 in rural areas. Women completing School Leaving Certificates have also experienced ultra-low fertility of 1.7. This paper examines fertility levels, trends and differentials. It also employs a decomposition analysis technique to determine the components of changes in total fertility rate (TFR) due to marital structure and marital fertility, covering the inter-survey periods, 1991-1996, 1996-2001, 2001-2006 and 2006-2011. Results show that during the period of 1991-1996, marital structure contributed to the rise in fertility, which was more than counterbalanced by the negative influence of the decline in marital fertility. In the later periods, while changes in marital structure began to play some role in the fertility decline, the contribution of marital fertility was still more pronounced. Rise in contraceptive use has been the primary reason for fertility decline. Age at marriage has begun to rise slowly. However, most recently, contraceptive use has not increased to explain the continuous fall in fertility. Factors such as an increase in male migration and induced abortion have been suggested as causes of the continued decline in fertility.

Keywords

Introduction

Fertility decline has become a widespread phenomenon in developed countries. Common reasons behind such decline are, among others, rise in contraceptive use, urbanization and socioeconomic changes, such as rise in age at marriage and increase in women's education and women's employment outside the home. Almost all the European countries have experienced a long-term downward trend in fertility, approaching below replacement level (Grant et al., 2004).

Bongaarts (2008) showed that a rapid fertility decline has occurred in many developing countries, including those in Asia. Asia has experienced a remarkable success in reducing fertility over the past three decades. According to the United Nations (2013), TFR reached

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2.2, close to replacement level, during the period 2005-2010, down from 4 during the period 1975-1980. This regional average, however, masks a considerable difference in the TFR observed among subregions. The TFR has plummeted to below replacement level in East Asia (1.6), while Western Asia, South Central Asia and Southeast Asia exhibited total fertility rates of 2.9, 2.7 and 2.4, respectively.

Within subregions, TFR varies, to a large extent, by country. Fertility has dropped to below replacement level (2.1 births per woman) in East Asia, except Mongolia. In Southeast Asia, below replacement fertility has been reached in Malaysia, Myanmar, Singapore, Thailand and Vietnam, while in South Central Asia, Iran is the only country exhibiting below replacement fertility. In Western Asia, Armenia, Azerbaijan, Cyprus, Georgia, Lebanon and the United Arab Emirates have achieved below replacement fertility.

Abbasi-Shavazi and Gubhaju (2014) studied the trend toward low fertility in 18 Asian countries, where the total fertility rate has reached the replacement level of 2.1 births per woman during the period 2005-2010. The primary reasons for low fertility in these countries were delayed onset of childbearing, aided in part by contraceptive use, increase in age at marriage, advancement of education and continued disapproval of cohabitation and childbearing outside marriage (Abbasi-Shavazi & Gubhaju, 2014). Makinwa-Adebusoye (2001) also found that the reduction in under-five mortality, rise in contraceptive use, especially the use of modern methods, and increase in age at marriage were the major factors affecting fertility decline in some African countries.

According to Abbasi-Shavazi and Gubhaju (2014), experience of such rapid decline in fertility in Asia may need to be incorporated in population policy, economic policy and social policy. Because a long-term, rapid decline in fertility leads to a shrinking working-age population and an aging population, the government should take prompt action to address potential problems associated with changes in age structure. The paper recommended that countries design their own policies taking into account their demographic, sociocultural, economic and institutional structures.

In general, studies of fertility are based on data using national averages, which mask the considerable differences in fertility by states, provinces or regions within countries. For instance, fertility tends to vary widely within countries. According to the National Family Health Survey-3 carried out in 2005-2006, the TFR in India was 2.7 (International Institute for Population Sciences & Macro International, 2007). While 10 states of India—namely Andhra Pradesh, Delhi, Goa, Himachal Pradesh, Kerala, Karnataka, Maharashtra, Punjab, Sikkim and Tamil Nadu—recorded TFRs at or below replacement level of 2.1 children per woman, some regions had above replacement-level fertility. In two states of India—Bihar and Uttar Pradesh—a woman had about four children during her lifetime. Likewise, in the Islamic Republic of Iran, Sistan and Baluchistan provinces in 2011 had the highest level of fertility (3.5) though the national TFR was 1.8 (Abbasi-Shavazi, Hosseini-Chavoshi, Khosravi & Banihashemi, 2013). This suggests that population policies should look beyond national or regional level variations and consider fertility levels at subnational and subregional levels as well.

In this context, Gubhaju, Jongstra and Raikoti (2014) examined fertility trends of ethnic Fijians and Indians in Fiji by applying the own-children method (Cho, 1973). In essence, the own-children method results in age-specific and total fertility rates for each of the 15 years preceding the census, based on data for mothers matched with their biological children. Reverse survival of these children allows reconstruction of birth rates for the years in which

those children were born by age of their mother, that is, age-specific fertility. It covered the intercensal periods of 1966-1976, 1976-1986, 1986-1996 and 1996-2007. This study found a spectacular decline in fertility in Fiji, but with a marked variation between Fijian and Indian ethnic groups. While the overall fertility in Fiji dropped to 2.6 in 2007, which is slightly above replacement level, the ethnic Indian fertility approached below replacement fertility of 1.9 and the ethnic Fijian fertility remained at 3.2.

Fertility decline has become a major concern in the area of socioeconomic development, given that a long-term decline in fertility increases the aging population and shrinks the working-age population. According to McDonald (2007), fertility decline is a major and direct cause of population aging. Policymakers attempt to moderate the rate of aging by increasing the birth rate. While there is a long and successful history of anti-natal policies, which helped to significantly reduce high fertility rates in developing countries, implementation of pro-natal polices in some advanced economies did not have much success in raising fertility.

Fertility decline in Nepal

Against this backdrop, it is important to carry out studies on fertility decline in Nepal, as there has recently been a precipitous decline in fertility. Moreover, identification of the causes and consequences of fertility decline is considered one of the major cross-cutting issues in the overall development of the country. Therefore, planners and policymakers rely on timely and reliable data on fertility to develop policies and implement programs for effective social planning and allocation of resources to public services, including education and health care.

Nepal has a long history of census-taking dating back to 1911. Since then, while censuses were conducted every 10 years, they have been conducted systematically only since 1961. The latest census was undertaken in 2011. The population of Nepal grew at a slow rate until the 1961 census, which showed the intercensal growth rate of 1.7% per annum. The intercensal growth rate accelerated to 2.1% in 1971 and 2.7% in 1981. The population growth rate then began to decline and fluctuated between 2.1% in 1991 and 2.2% in 2001. The 2011 census recorded a drastic decline in the growth rate of population to 1.4% in 2011 (Central Bureau of Statistics, 2012). The growth rate of the population is primarily determined by the interplay of fertility, mortality and international migration. The decline in the growth rate recorded in the latest census is consistent with the recent decline in fertility in Nepal.

Undoubtedly, the demographic and household characteristics collected in the census provide an excellent basis to study fertility levels, trends and differentials by different background characteristics, such as ethnicity, geographic area, urban-rural residence and educational attainment. However, demographic data generated from these censuses are far from reliable. It was not until the mid-1970s that reliable data on fertility became available in Nepal. The first national fertility survey, which was conducted in 1976 in collaboration with the World Fertility Survey, revealed a very high fertility among Nepalese women, estimated at 6.3 births per woman. This survey showed a low contraceptive use of 3% among currently married women of reproductive age and the prevalence of universal marriage (Ministry of Health, 1977). Since then, a series of national demographic surveys has been carried out in Nepal every five years: the Nepal Contraceptive Prevalence Survey (NCPS, 1981), Nepal Fertility and Family Planning Survey (NFFS, 1986), Nepal Family Health Survey (NFHS, 1991) and Nepal Demographic and Health Surveys (NDHSs, 1996; 2001; 2006 and 2011). The

recent Demographic and Health Survey (NDHS) was conducted in 2011. This paper uses secondary information from these surveys to examine levels, trends and differentials in fertility.

Objectives

Using national fertility survey data from 1976 to 2011, this paper first examines fertility levels, trends and differentials. It then uses a decomposition analysis technique to determine the components of changes in TFR due to marital structure and marital fertility, covering the inter-survey periods 1991-1996, 1996-2001, 2001-2006 and 2006-2011. This timeframe was chosen because a consistent trend in fertility decline was observed from 1991 onwards. Finally, this paper recommends policy implications of fertility transition in Nepal, which provides planners and policymakers timely information for formulating policies and implementing programs for the overall development of the nation.

Methodology

Levels, trends, differentials and age patterns of fertility are examined by using current fertility estimated directly from the survey data from 1976 to 2011. Factors that resulted in the fertility decline in Nepal over the past three and half decades are of considerable interest. Techniques have been developed to decompose fertility into its major proximate determinants (Bongaarts, 1978).

However, due to data limitations, the present study aims to decompose the changes in TFR into marital structure (proportions married at different ages) and marital fertility (fertility of married women) by means of a simple decomposition technique previously developed by Kitagawa (1955) and later adapted by Retherford and Ogawa (1978). Gubhaju, Jongstra and Raikoti (2014) applied this decomposition analysis technique to determine the components of changes in TFRs due to marital structure and marital fertility among Fijians and Indians in Fiji, covering the intercensal periods of 1966-1976, 1976-1986, 1986-1996 and 1996-2007.

Fertility decomposition

According to the technique, the total fertility rate can be written as: TFR = $5\sum f_i$; also, TFR = $5\sum M_i.F_i$, where f_i is the age-specific fertility rates in the age group i, M_i (marital structure) is the proportion of women married in the age group i, and F_i is the age-specific marital fertility rate (fertility of married women) in the age group i. The changes in TFR can then be decomposed into components as follows:

$$\Delta\text{TFR} = 5\sum \overline{F}_i.\Delta M_i + 5\sum \overline{M}_i.\Delta F_i.$$

Where the symbol Δ denotes changes and $\overline{F}_i$ and $\overline{M}_i$ are averages over the period, obtained by summing the beginning and end values and dividing by 2. In this equation, the first on the right-hand side of the equation is the contribution of the changes in TFR due to changes in marital structure and the second indicates the changes in TFR due to changes in marital fertility. Each of the two components can also be broken down by five-year age groups.

Results

Trends in age-specific fertility rate and total fertility rate

Table 1 presents trends in age-specific fertility rate (ASFR) and TFR at the national level. These data reveal that while fertility transition in Nepal started in the 1980s, the decline was rather modest until the early 1990s. Nepal witnessed a sustainable decline in fertility since then, falling from 5.1 children per woman in 1991 to 4.6 in 1996 and 4.1 in 2001, with a further drop to 3.1 in 2006. A declining trend in fertility continued and the most recent survey shows that the TFR has fallen to close to replacement level, with 2.6 children per woman in 2011. Reduction of fertility by half in two decades (from 5.1 in 1991 to 2.6 in 2011) and by one child per woman in five years (4.1 in 2001 to 3.1 in 2006) can be considered a remarkable achievement.

Table 1: Trends in age-specific fertility rates (per 1,000 women) and total fertility rates, Nepal, 1976 to 2011

Age group	NFS 1976	NCPS 1981	NFFS 1986	NFHS 1991	NFHS 1996	NDHS 2001	NDHS 2006	NDHS 2011
15-19	145	94	50	98	127	110	98	81
20-24	290	248	216	280	266	248	234	187
25-29	295	253	203	245	229	205	144	126
30-34	269	197	152	187	160	136	84	71
35-39	169	160	124	129	94	81	48	36
40-44	75	67	66	60	37	34	16	14
45-49	23	34	19	19	15	7	2	5
TFR	6.3	5.3	4.1	5.1	4.6	4.1	3.1	2.6

Source: Ministry of Health, 1993; Ministry of Health and Population, 2012.
Note: The total fertility rate is defined as the number of children that would be born per woman if all women lived to the end of their childbearing years and bore children at a given set of age-specific fertility rates.
Rates refer to the three-year period prior to the survey.

Trends in age-specific fertility rate explain the decline in fertility due to changes in marital structure and marital fertility. Figure 1 clearly reveals a consistent pattern of fertility throughout the survey periods from 1991 to 2011. Due to the prevalence of early and universal marriage in Nepal, peak fertility occurs in women ages 20-24 followed by 25-29. Consistent with the prevalence of early age at marriage, adolescent fertility (women ages 15-19) is relatively high, although that trend is declining. Fertility has declined in almost every age group, with the exception of adolescent fertility which increased between 1991 and 1996, consistent with the drop in age at marriage, discussed later. What is so striking in the age pattern of fertility is that between 2001 and 2006, there has been an accelerated decline in fertility in the prime reproductive age groups 20-39, which is attributed mainly to the fertility control within marriage due to contraceptive use and, to some extent, rise in age at marriage.

Figure 1: Age-specific fertility rates (per 1,000 women) Nepal, 1991-2011
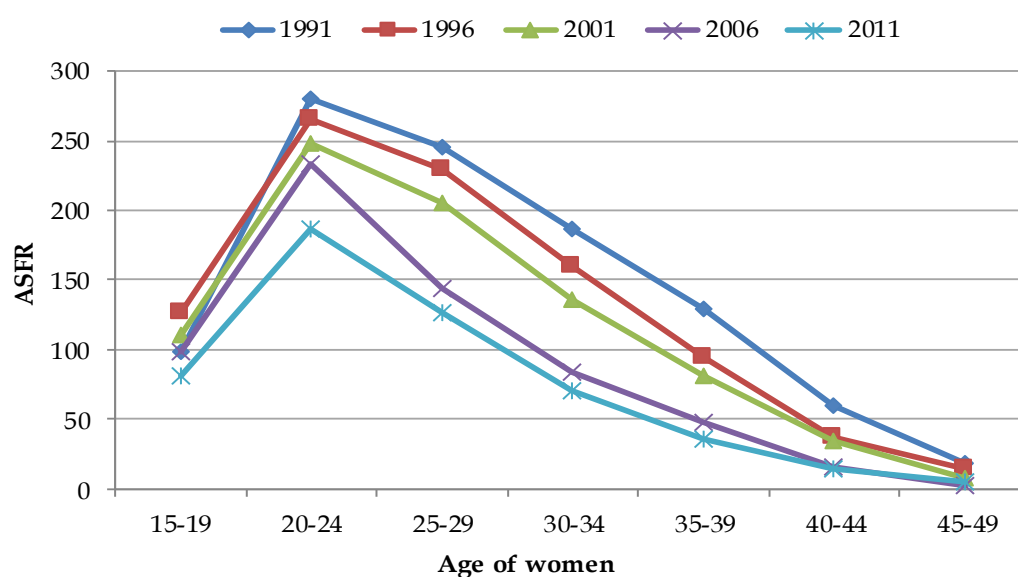
Examination of fertility levels and differentials by socioeconomic and demographic parameters and understanding the causes of fertility decline in Nepal are primary issues of concern. Several authors have examined the onset of fertility decline in Nepal in the past (Tuladhar, 1989; Niraula, 1990; Karki & Krishna, 2008). Results of the decomposition analysis are presented in Table 2 and summarized in Figure 2.

It is evident from Table 2 and Figure 2 that fertility decline between 1991 and 1996 is primarily due to the decline in marital fertility. In fact, marital structure contributed to the rise in fertility by 29%, which was more than counterbalanced by the negative influence of the decline in marital fertility. During the periods 1996-2001 and 2001-2006, changes in marital structure contributed to the decline in fertility by 12%, while the contribution of marital fertility was more pronounced, explaining 88% of the decline in the TFR. The role of marital structure in reducing fertility increased during the period 2006 and 2011, with over one-fifth of the decline in TFR explained by the changes in marital structure. However, the role of marital fertility was still the dominant factor in reducing fertility, explaining about four-fifths of the decline in the TFR.

Table 2: Decomposition of the changes in total fertility rate, Nepal, 1991-2011

Age of women	ASFR per 1,000 women		Components of change		
			Marital structure	Marital fertility	Total
1991-1996					
15-19	98.0	127.0	-32.1	3.1	-29.0
20-24	280.0	266.0	-4.3	18.3	14.0
25-29	245.0	229.0	1.0	15.0	16.0
30-34	187.0	160.0	3.9	23.1	27.0
35-39	129.0	94.0	3.1	31.9	35.0
40-44	60.0	37.0	1.4	21.6	23.0
45-49	19.0	15.0	0.7	3.3	4.0
TFR	*5.09*	*4.64*	*-131.3*	*581.3*	*450.0*
			-29.2%	129.2%	100%

Age of women	ASFR per 1,000 women		Components of change		
			Marital structure	Marital fertility	Total
1996-2001					
15-19	127.0	110.0	10.0	7.0	17.0
20-24	266.0	248.0	5.9	12.1	18.0
25-29	229.0	205.0	0.2	23.8	24.0
30-34	160.0	136.0	-1.4	25.4	24.0
35-39	94.0	81.0	-0.6	13.6	13.0
40-44	37.0	34.0	-0.5	3.5	3.0
45-49	15.0	7.0	-0.4	8.4	8.0
TFR	*4.64*	*4.11*	*66.0*	*469.0*	*535.0*
			12.3%	87.7%	100%
2001-2006					
15-19	110.0	98.0	22.1	-10.1	12.0
20-24	248.0	234.0	4.7	9.3	14.0
25-29	205.0	144.0	-1.1	62.1	61.0
30-34	136.0	84.0	-0.8	52.8	52.0
35-39	81.0	48.0	-0.5	33.5	33.0
40-44	34.0	16.0	-0.2	18.2	18.0
45-49	7.0	2.0	0.0	5.0	5.0
TFR	*4.11*	*3.13*	*120.9*	*854.1*	*975.0*
			12.4%	87.6%	100%
2006-2011					
15-19	98.0	81.0	10.0	7.0	17.0
20-24	234.0	187.0	10.4	36.6	47.0
25-29	144.0	126.0	3.9	14.1	18.0
30-34	84.0	71.0	-0.8	13.8	13.0
35-39	48.0	36.0	-0.4	12.4	12.0
40-44	16.0	14.0	-0.3	2.3	2.0
45-49	2.0	5.0	-0.1	-2.9	-3.0
TFR	*3.13*	*2.60*	*113.8*	*416.2*	*530.0*
			21.50%	78.50%	100%

Figure 2: Components of the changes (percent) in the total fertility rate due to marital structure and marital fertility, Nepal, 1991-2011
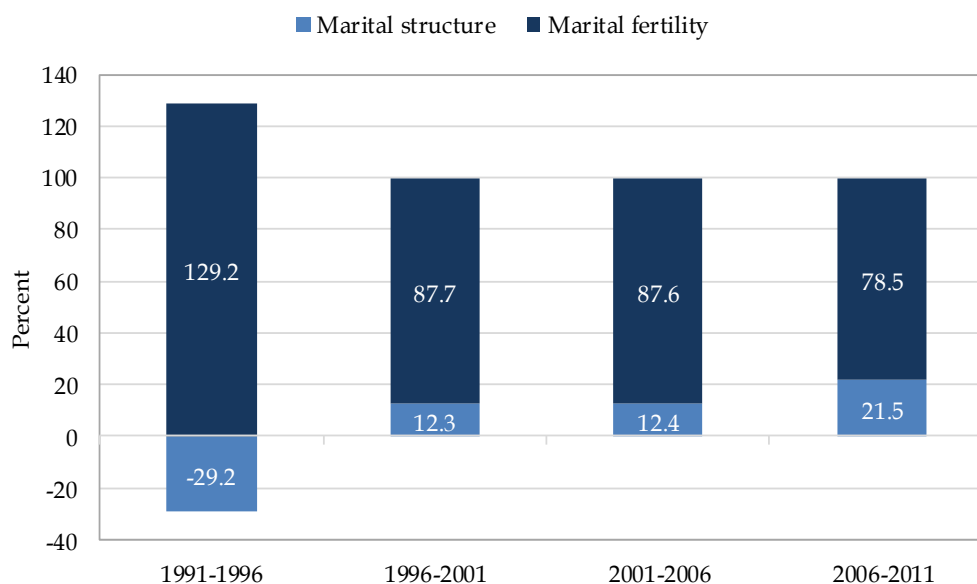
As a result of the continuous fall in fertility and increase in longevity, Nepal has undergone a substantial change in the age structure of the population, which will continue for several decades. On the one hand, the percentage of young population below age 15 has declined. On the other hand, the percentage of working-age population 15-64 has increased. The share of the population 60 years and older is relatively low, which is about 8% currently. According to the United Nations (2013), this figure is expected to increase to 10% in 2025 and 18% in 2050. As a result of the changes in age structure, both the youth and old-age dependency ratios are expected to decline.

This is a unique opportunity for social and economic development, as the country will experience a significant increase in the working-age population, which is about 62% currently. The proportion of working-age population will continue to rise and will remain at around 68%, which will last for several decades (United Nations, 2013).

Explanation of Fertility Decline

Several factors have contributed to the fertility decline in Nepal. Proximate determinants of fertility are, for example, age at marriage, use of contraception, incidence of abortion and post-partum amenorrhea. Fertility decline can be explained by using such factors as education of women and place of residence. Labor migration of males may also contribute to the decline in fertility.

Table 3: Total fertility rates by education and place of residence of women, NDHS 2006 & 2011

	2006	2011
Education of women		
No education	3.9	3.7
Primary education	2.8	2.7
Secondary education	2.3	2.1
School Leaving Certificates and above	1.8	1.7
Place of residence of women		
Urban	2.1	1.6
Rural	3.3	2.8

Source: Ministry of Health and Population, 2012
**Note:** Rates refer to the three-year period prior to the survey.

While overall fertility decline has occurred in Nepal, there are certain socioeconomic groups that may not have experienced similar decline. What is so striking about the fertility decline in Nepal is that some groups of women have experienced an unprecedented drop in fertility to below replacement level. For instance, in 2011 women in urban areas reached an ultra-low fertility of 1.6 children per woman compared with 2.8 among women in rural areas. Likewise, below replacement fertility was reached by women who had completed secondary education while women who had completed school leaving certificates experienced an ultra-low fertility of 1.7 children per woman (Table 3). However, women with primary education and those with no education reported higher TFRs of 2.7 and 3.7 respectively (Ministry of Health and Population, 2012).

Age at marriage and proportion married

This study is primarily concerned with fertility of women within marriage, or marital fertility. Age at which women marry is one of the primary determinants of fertility. Women who marry early, on average, are more likely to have their first child at a young age and give birth to many children, obviously contributing to high fertility. NDHS 2011 data shows that although marriage occurs relatively early in Nepal and is almost universal, age at marriage among women is slightly on the rise. Of those women ages 15-49, over half (55%) were married by age 18 and almost three-quarters were married by age 20. Although mean age at marriage is on the rise, it has not increased significantly (Ministry of Health and Population, 2012). In fact, the singulate mean age at marriage of women (SMAM) calculated from the survey data reveals that SMAM dropped from 19.4 to 18.7 years between 1991 and 1996, explaining the rise in fertility due to marital structure shown in the decomposition analysis. It was only after 1996 that the SMAM began to rise, from 19 years in 2001 to 19.4 years in 2006 and 19.9 years in 2011 (Figure 3).

Figure 3: Trends in singulate mean age at marriage of women (SMAM), Nepal, 1991-2011
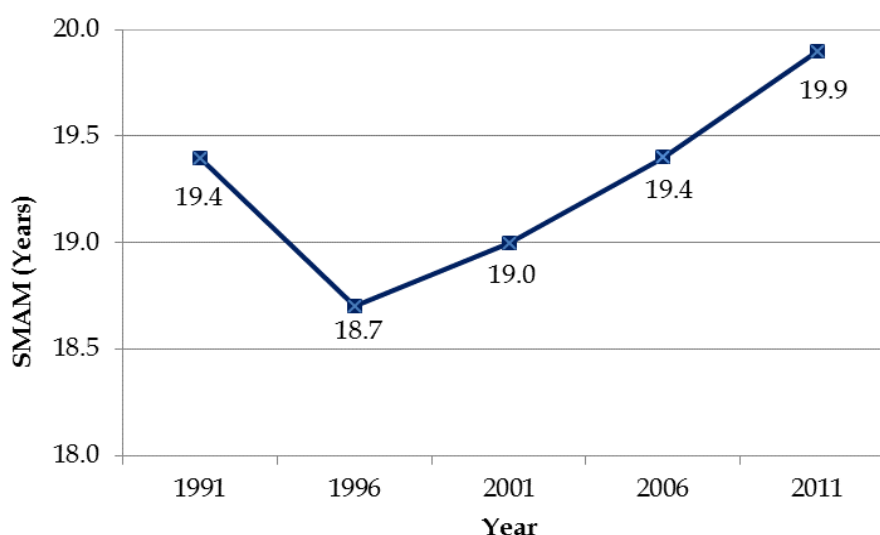
According to the NDHS 2011, 76% of women and 64% of men ages 15-49 are currently married. A higher proportion of men (35%) than women (21%) have never been married. There is a negligible difference in the proportion of divorced, separated and widowed between women and men. Thus, it is not only that marriage is universal, but also women get

married much earlier than men. For example, more teenage girls ages 15-19 (29%) are in formal marriages than teenage boys (7%). The proportion of married women increases rapidly by age, rising from 29% among women ages 15-19 to 77% among those ages 20-24. By ages 25-29, more than 90% of women are married. A lower percentage of women ages 45-49 are in marital unions, primarily due to widowhood at older ages. Among men, the percentage married also increases rapidly from 7% in the age group 15-19 to 45% in the age group 20-24 and 81% in the age group 25-29. Marriage is nearly universal among those ages 30 and older.

Age at which women marry depends upon their opportunities for education during adulthood. A study by Sah (2014) found that women's level of education is directly related to age at marriage. Women with primary education had a 25% lower risk of marrying young than those women who had no education. Similarly, women with secondary education and those with above high school education had 57% and 84%, respectively, lower risks of marrying young than those women with no education. He concluded that women tend to postpone their marriage while they are in school. As higher levels of women's education are linked with delayed marriage, this will obviously have negative effects on fertility.

Yet another important factor affecting fertility decline is type of place of residence (rural/urban). As discussed above, women living in urban areas have lower fertility as compared to those women living in rural areas. This is, to some extent, associated with age at marriage. In fact, girls in rural areas are more likely to marry at young ages than girls in urban areas. This is primarily due to the fact that there are more opportunities for higher education for girls in urban settings than in rural areas (Sah, 2014). G. C. and Shrestha (2014) also confirmed that of those women completing school leaving certificates and above, 27% were from urban areas, while only 8% were from rural areas. Their study also revealed that the age at marriage of girls is gradually increasing in Nepal. While the determinants of marriage timing is a complex phenomenon, the prominent factors influencing marriage timing of women are, among others, education of women, place of birth and age at menarche (Sah, 2014).

The trend of internal migration from rural to urban areas is also on the rise and there is a sizable growth in the number of urban areas. According to the Central Bureau of Statistics (2012), the number of urban areas rose from 58 in 2001 to 99 in 2011, and further increased to 130 in 2014. Place of residence in urban areas is associated with higher levels of women's education, delayed marriage and, consequently, low fertility. Therefore, with the present trend of urban growth, increase in women's education and delayed age at marriage, fertility will continue to decline in the near future.

Contraceptive prevalence

Consistent with the decline in fertility, use of modern methods of contraception has increased significantly, rising from 3% in 1976 to 29% in 1996, almost a 10-fold increase in two decades. Use of modern methods of contraception increased further to 39% in 2001 and 44% in 2006. However, there has been a slight drop in the use of modern methods of contraception by one percentage point, to 43% in 2011. Overall, use of any method of contraception has increased from 31% in 1996 to 43% in 2001 and 48% in 2006, with only a slight increase to about 50% in 2011 (Table 4). This result of the decomposition analysis is supported by the data on contraceptive use, which has risen significantly from 1991 to 2006, but with a very small increase in 2011.

The most preferred method of family planning, according to the NDHS 2011, is female sterilization, followed by injectables and male sterilization. At the time of initiation of the family planning program in Nepal, male sterilization was the most popular method of family planning, which was overtaken by female sterilization, which has remained as the most preferred method.

It is to be noted that the contraceptive prevalence rate in Nepal has remained almost unchanged between 2006 and 2011, and the use of female sterilization has dropped slightly from 18% in 2006 to 15% in 2011, while male sterilization has increased from six to eight percent during the same period.

According to the NDHS 2011, among married women of reproductive ages, 27.5% have an unmet need for family planning, 9.9% for birth spacing and 17.6% for limiting. Meeting the family planning needs of these women could likely further reduce fertility in Nepal.

Table 4: Trends in current use of contraception by methods, Nepal 1976-2011

| Contraceptive Methods	1976 NFS	1981 NCPS	1986 NFFS	1991 NFFS	1996 NFHS	2001 NDHS	2006 NSHS	2011 NDHS
Any method	-	-	-	-	31.3	42.8	48	49.7
Any modern method	2.9	7.6	15.1	24.1	28.8	38.9	44.2	43.2
Female sterilization	0.1	2.6	6.8	12.1	13.3	16.5	18	15.2
Male sterilization	1.9	3.2	6.2	7.5	6	7	6.3	7.8
Pill	0.5	1.2	0.9	1.1	1.5	1.8	3.5	4.1
Injectables	0	0.1	0.5	2.3	5	9.3	10.1	9.2
Condom	0.3	0.4	0.6	0.6	2.1	3.2	4.8	4.3
Norplant	-	-	-	0.3	0.5	0.7	0.8	1.2
IUD	0.1	0.1	0.1	0.2	0.3	0.4	0.7	1.3
Any traditional method	-	-	-	-	2.5	3.9	3.7	6.5
Rhythm	-	-	-	-	0.9	1.1	1.2	1.1
Withdrawal	-	-	-	-	1.4	2.6	2.6	5.4
Other	-	-	-	-	0.2	0.3	0	0
Not currently using	-	-	-	-	71.5	60.7	52	50.3
Total	**-**	**-**	**-**	**-**	**100**	**100**	**100**	**100**
Number of women	**-**	**-**	**-**	**-**	**7,982**	**8,342**	**8,257**	**9,608**

Source: Ministry of Health and Population, 2012

As previously mentioned, there has been no significant increase in contraceptive use between 2006 and 2011. However, an increase in the number of women with higher education, who are more likely to use contraceptives, may mean that use has increased among certain groups of women, such as educated women living in urban areas. Census data analyzed by Shakya (2014) revealed that among those who have completed graduate level education, the sex ratio of female graduates increased significantly (45.6 females per 100 males in 2011 as compared to 22.9 females per 100 males in 2001). Hence, the rise in the proportion of women acquiring higher education plays a central role in controlling fertility.

Census data examined by Adhikary (2014) found that the proportion of women in the reproductive ages 15-49 is higher in the 2011 census than in the 2001 census. Furthermore, the proportion of these women in urban areas of Nepal is higher in the 2011 census than the

2001 census. Hence, there has been a rise in the proportion of women in reproductive ages in urban areas who are more likely to be educated and employed, adding that a higher proportion of these women are likely to be users of modern method of contraception. This will obviously have implications for a further reduction in fertility in Nepal (Adhikary, 2014; Sah, 2014; Shakya, 2014).

The use of modern contraceptive methods is a direct cause and a prime determinant of fertility decline. In the case of Nepal, however, as evident in Figure 4, the effect of contraceptive use in explaining the recent fertility decline is somewhat weak. According to Bongaarts, Cleland, Townsend, Bertrand and Gupta (2012), increase in contraceptive prevalence by 15-17 percentage points is required to reduce the total fertility rate by one birth per woman. As the data on contraceptive prevalence fails to support this relationship in the case of Nepal, this study explores other factors beyond family planning to explain the recent fertility decline, such as male migration and induced abortion.

Figure 4: Relationship between total fertility rate and contraceptive prevalence rate (modern method)
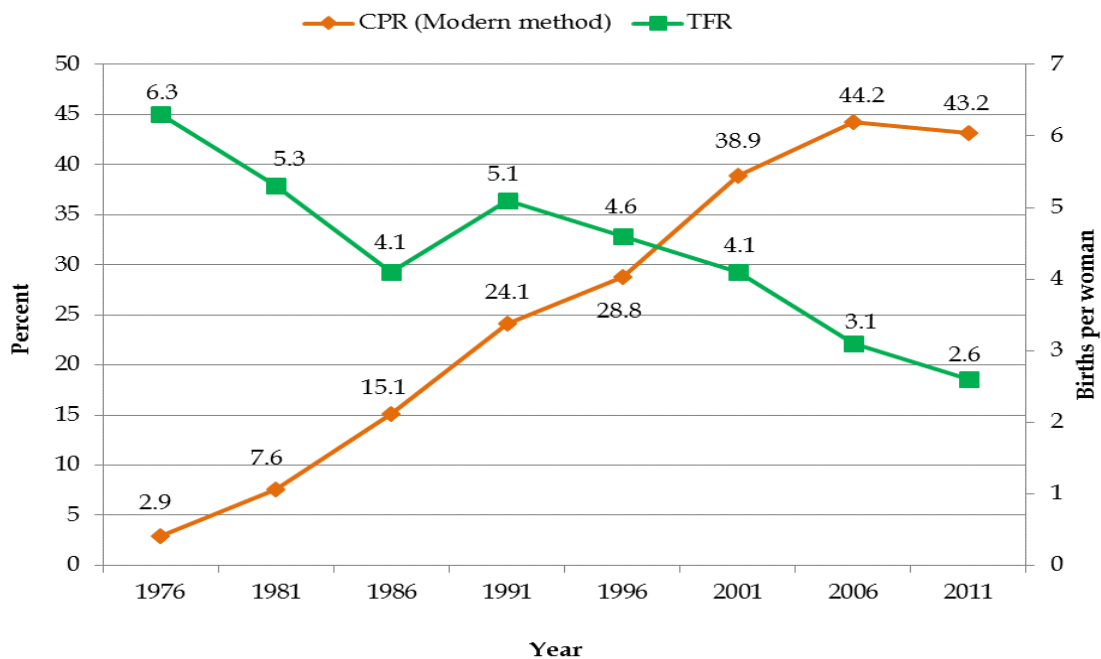
Male migration

Male migration has emerged as a recent phenomenon as Nepal has witnessed an exodus of men in search of employment abroad. An overwhelming majority of men going overseas for employment fall in the working ages, and many of them leave their wives and children at home. While the 2011 census enumerated a total population of 26.5 million, about two million people were listed as absentees during the census night, the majority of whom were of reproductive age (Central Bureau of Statistics, 2012). This is a big jump from the absentee population of 762,000 recorded during the 2001 census. It has been elucidated that a large number of the young population, particularly males, has been consistently moving abroad to different destinations, mainly to the gulf countries, South Korea and Malaysia. About half of

the male migrants (47%) recorded in the 2011 census belonged to the age group 15-34 (Shakya, 2014).

The proportion of married women with non-resident husbands increased from 26% in 2006 to 32% in 2011. Furthermore, the proportion of married women whose husbands had been away for less than one year increased slightly from 19% in 2006 to 21% in 2011. The proportion of married women whose husbands had been away for more than a year increased sharply from 7% in 2006 to 11% in 2011 (Khanal, Shrestha, Pant & Mehata, 2013).

The fact that many men in reproductive ages, most of whom are married, are leaving the country will obviously have implications for fertility decline. As expected, analysis of the NDHS 2006 and 2011 data confirmed that the fertility rate was much lower among women whose husbands had been away for at least a year than among women living with their husbands (Khanal et al., 2013). According to the NDHS 2006, the TFR was 3.0 among women whose husbands had been away for at least a year as compared with 3.9 among those women living with their husbands. This figure in the NDHS 2011 was 2.6 and 3.4, respectively. In both surveys, absolute difference in fertility was roughly similar among women whose husbands had been away for at least a year and women living with their husbands (Table 5).

Table 5: Urban-rural differentials in fertility of married women by husbands' migration status, NDHS 2006 & 2011

	2006				2011			
	All married women	Living together with husband	Husbands living Elsewhere		All married women	Living together With husband	Husbands living elsewhere	
Residence			<1 year	≥ 1 year			<1 year	≥ 1 year
Urban	3.0	3.1	3.1	1.8	2.5	2.6	2.2	1.7
Rural	4.0	4.1	4.1	3.1	3.5	3.7	3.4	2.7
Total	**3.9**	**3.9**	**4.0**	**3.0**	**3.4**	**3.6**	**3.3**	**2.6**

Source: Khanal et al., 2013

However, the disparity in fertility is more pronounced in urban areas between women whose husbands had been away for at least a year and those women living with their husbands. For instance, data from both surveys clearly show that in urban areas, fertility was below replacement level (1.8 and 1.7, respectively, in 2006 and 2011) among women whose husbands had been away for at least a year as compared to those women living with their husbands (3.1 and 2.6, respectively, in 2006 and 2011). By contrast, in rural areas, the difference in fertility was only one child between these two groups of women. These data indicate that besides other factors affecting fertility, male migration has, to some extent, contributed to the decline in fertility in Nepal. This may partially explain the fact that despite the unchanged level of contraceptive use during the period of 2006-2011, fertility has continued to decline in Nepal. However, incidence of induced abortion also cannot be overlooked as a factor explaining the recent fall in fertility.

Induced abortion

Incidence of induced abortion is one of the proximate determinants of fertility and is widely considered as having significant impact in reducing fertility, particularly in countries where abortion is legal. In the case of Nepal, while the government passed a liberal abortion law in

2002, the first government abortion service officially opened in March 2004. According to the abortion law, women have the right to voluntarily terminate pregnancy of up to 12 weeks. Termination of pregnancy of up to 18 weeks is allowed if the pregnancy is due to rape or incest. In addition, women have the right to seek abortions upon the advice of a medical practitioner at any time during a pregnancy if the pregnancy poses a danger to the woman's life or to her physical or mental health, or in cases of fetal abnormality or impairment (Thapa, 2004).

Since the legalization of abortion, the number of women seeking abortion services has steadily increased over the years. Initially, there were some 20,000 women who had undergone abortion from abortion clinics certified by the government. By mid-2011, this number has increased exponentially to nearly 500,000 women (Thapa, Neupane, Basnett & Read, 2012; Thapa, Sharma & Khatiwada, 2014).

Analyzing data on women who had undergone abortion, Thapa and Padhye (2001) found that 34% of women ages 25-29 did not want more children. Also noted in the study is that these women who had undergone abortion were married and had at least two living children. The main reason mentioned was that the current pregnancy was unintended and that they decided to seek the termination of an unwanted child.

As expected, the incidence of abortion is higher in urban than in rural area, which is presumably due to the availability and accessibility of services located in urban areas. Repeat abortion has also become a common practice. A study by Thapa and Neupane (2013) found that about one-third of women (32.3% of 1172 women) have experienced abortion more than once.

The purpose of the legalization of abortion was not to use it as a method of family planning, though. The overarching goal of the abortion law was to reduce maternal morbidity and mortality due to unsafe abortions, ensuring safe motherhood and women's rights. Importantly, high quality family planning services should be provided along with safe abortion services (Thapa, 2004). However, in light of the availability and accessibility of services as well as the increase in the number of service providers, the incidence of abortion and repeat abortions, it is apparent that induced abortion may have become a part of fertility control. While it is too early to quantify the impact of induced abortion, it can be inferred that the number of abortions and repeat abortions performed so far may have, to some extent, contributed to fertility decline in Nepal. However, more research is needed to better understand its impact.

Discussion

Using national fertility survey data from 1976 to 2011, this paper examines fertility levels, trends and differentials. While fertility transition in Nepal started in the 1980s, the decline was rather modest until the early 1990s. Nepal witnessed a sustained decline in fertility, falling from 5.1 children per woman in 1991 to 4.6 in 1996 and 4.1 in 2001, with a further drop to 3.1 in 2006 and 2.6 in 2011. Reduction of fertility by half in two decades (from 5.1 in 1991 to 2.6 in 2011) and by one child per woman in five years (4.1 in 2001 to 3.1 in 2006) is a remarkable achievement. Results also show that fertility in urban areas has reached an ultra-low level of 1.6 compared with 2.8 in rural areas. Women who had completed school leaving certificates have also experienced ultra-low fertility.

This paper reveals that a continuous drop in fertility and increase in longevity have resulted in a substantial change in the age structure of the population, leading to a decrease in the young population and an increase in working-age population. The nation is, therefore, currently well-placed to reap the "demographic dividend" before its population starts aging rapidly. However, the government would need to urgently establish appropriate social and economic policies to reap the benefits of the demographic dividend to spur economic growth. Therefore, to fully capitalize on the benefits, it is important to create awareness among planners and policymakers about these changes in age structure brought about by the decline in fertility and increase in longevity, and the relevance of the demographic dividend for investment planning and human resources development policy formulation. The demographic dividend is a one-time window of opportunity that the nation should use to its benefit. Some policy recommendations for stimulating economic growth as a result of the demographic dividend include, for example, massive investments in education and human resource development. Such investments are possible because of savings from the low dependency ratios resulting from the demographic transition. These savings should be properly utilized to increase the capacity of the current and future labor forces to participate fully in a skill-based economy.

While implementing policies and preparing programs to reap the benefits of the demographic dividend, Nepal should also learn from the experiences of low fertility countries in East and Southeast Asia. The country should foresee the possible consequences of declining fertility and increasing longevity in the near future, namely, the aging of the population. Although older persons in Nepal represent about 8% of the total population, a crucial agenda for the government should be to plan for an aging society before fertility drops well below replacement level. It is, therefore, timely to address the needs of older persons and start implementing policies to improve the living conditions, health, welfare and general quality of life of older adults in Nepal.

This paper used a decomposition analysis technique to determine the components of changes in TFR due to marital structure and marital fertility, covering the inter-survey periods 1991-1996, 1996-2001, 2001-2006 and 2006-2011. This is because a consistent trend in fertility decline was observed from 1991 onwards.

Results show that during the period of 1991-1996, marital structure contributed to the rise in fertility, which was more than counterbalanced by the decline in marital fertility. In the later periods, while changes in marital structure began to play some role in the fertility decline, the contribution of marital fertility was still more pronounced. An increase in contraceptive use was the primary reason for fertility decline in the initial period. Age at marriage began to rise slowly. However, in the recent period, contraceptive use had not increased to explain the continuous fall in fertility. Factors such as increases in male migration and induced abortion have been suggested as causes of the recent decline in fertility. Due to lack of sufficient data, this paper is not able to quantify the impact of male migration and induced abortion on fertility decline. However, it can be inferred that the rising number of men migrating overseas in the prime reproductive age groups and the rising number of abortions and repeat abortions may have, to some extent, contributed to the recent fertility decline in Nepal. However, there is need for more research to determine the impact of these factors on fertility decline.

One limitation of this study is that the current measures of migration are not adequate enough to capture how migration affects fertility. A refined measure of migration and return

migration is needed to better estimate the contribution of migration to fertility decline, as opposed to contraception. Additional data on induced abortion might also be helpful in quantifying the impact of abortion on fertility decline.

With this in mind, the next round of the Demographic and Health Survey in Nepal being planned for 2016 should consider including additional data on overseas male migration and induced abortion, along with detailed fertility history of women and its covariates, such as child mortality, reproductive health and other socioeconomic variables. This would allow researchers to carry out in-depth studies on socioeconomic, demographic and health factors affecting fertility and identification of proximate determinants of fertility, such as contraceptive prevalence, age at marriage, male migration and induced abortion.

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