NEPAL FURTHER ANALYSIS

A Comparative Analysis of Unmet Need in Nepal

Further Analysis of the 2006 Nepal Demographic and Health Survey

This report presents findings from a further analysis study undertaken as part of the follow up to the 2006 Nepal Demographic and Health Survey (NDHS). Macro International Inc. provided technical assistance for the project. Funding was provided by the U.S. Agency for International Development (USAID) under the terms of Contract No. GPO-C-00-03-00002-00. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

This report is part of the MEASURE DHS program, which is designed to collect, analyze, and disseminate data on fertility, family planning, maternal and child health, nutrition, and HIV/AIDS.

Additional information about the 2006 NDHS may be obtained from Population Division, Ministry of Health and Population, Government of Nepal, Ramshahpath, Kathmandu, Nepal; Telephone: (977-1) 4262987; New ERA, P.O. Box 722, Kathmandu, Nepal; Telephone: (977-1) 4423176/4413603; Fax: (977-1) 4419562; E-mail: info@newera.wlink.com.np. Additional information about the DHS project may be obtained from Macro International Inc., 11785 Beltsville Drive, Calverton, MD 20705 USA; Telephone: 301-572-0200, Fax: 301-572-0999, E-mail: reports@macrointernational.com, Internet: http://www.measuredhs.com.

Recommended citation:

Aryal, Ram Hari, Ram Sharan Pathak, Bhogendra Raj Dottel, and Prakash Dev Pant. 2008. *A Comparative Analysis of Unmet Need in Nepal: Further Analysis of the 2006 Nepal Demographic and Health Survey*. Calverton, Maryland, USA: Macro International Inc.

A Comparative Analysis of Unmet Need in Nepal

Further Analysis of the 2006 Nepal Demographic and Health Survey

Dr. Ram Hari Aryal
Dr. Ram Sharan Pathak
Mr. Bhogendra Raj Dottel
Dr. Prakash Dev Pant

May 2008

Contents

List of Tables

List of Figures

1 Background

The need for family planning services in Nepal was recognized as early as 1958, when a private organization, the Nepal Family Planning Association, was established in Kathmandu. The government of Nepal formally adopted a national family planning policy in 1965, with limited services available to the Kathmandu Valley until 1968. In 1968 a semiautonomous board, the Nepal Family Planning and Maternal Child Health Board was established, which was formally authorized to formulate and implement a family planning policy and program for the entire country. The board, with the help of paramedics and health-care workers with some basic training, embarked on delivering family planning and maternal and child health services outside the Kathmandu Valley. By 1989, these services were expanded to 52 of the 75 districts in Nepal. In the early 1990s, the Family Health Division of the Ministry of Health was assigned the responsibility of providing family planning services throughout Nepal.

Family planning and maternal and child health services in Nepal are administered through stationary offices, mobile facilities, and door-to-door campaigns. Stationary offices are generally attached to a health care institution, such as health posts, health centers, or hospitals. Mobile facilities were introduced because of the remoteness of much of the population and the lack of local family planning facilities, or easy access to such facilities. The mobile facilities reached a large part of the country, and emphasized sterilization almost exclusively. Mobile sterilization camps moved around the country; local residents were notified of their scheduled arrival in advance, and were asked to take advantage of the service. A few days or even weeks prior to the arrival of the camp, a campaign was launched to motivate and educate people about the benefits of family planning. The camps generally lasted only a few days and rarely more than a week. Because most villagers were unwilling to come to family planning centers to obtain services, the Nepal Family Planning and Maternal Child Health Board launched a door-to-door campaign to educate villagers about family planning and to distribute oral contraceptives and condoms on a periodic basis. Four methods of family planning were initially introduced—sterilization (male and female), the IUD, pills, and condoms—and were offered by both the government and non-government sectors. Injectables were introduced in 1973 on an experimental basis in one district, and were gradually made available in other parts of Nepal.

Data from the 2006 NDHS show that 25 percent of currently married women in Nepal have an unmet need for family planning with 9 percent expressing a need for spacing and 15 percent a need for limiting.[1] Figure 1.1 shows that there has been a decline in the unmet need for family planning over the past ten years, with unmet need in 2006 being 22 percent lower than it was in 1996 (25 percent versus 31 percent). There was a 34 percent decrease in the proportion of women with unmet need for spacing while the proportion of women with an unmet need for limiting decreased by 11 percent during the same period. On the whole, these trends are positive because they show a couple's increasing ability to achieve their childbearing goals.

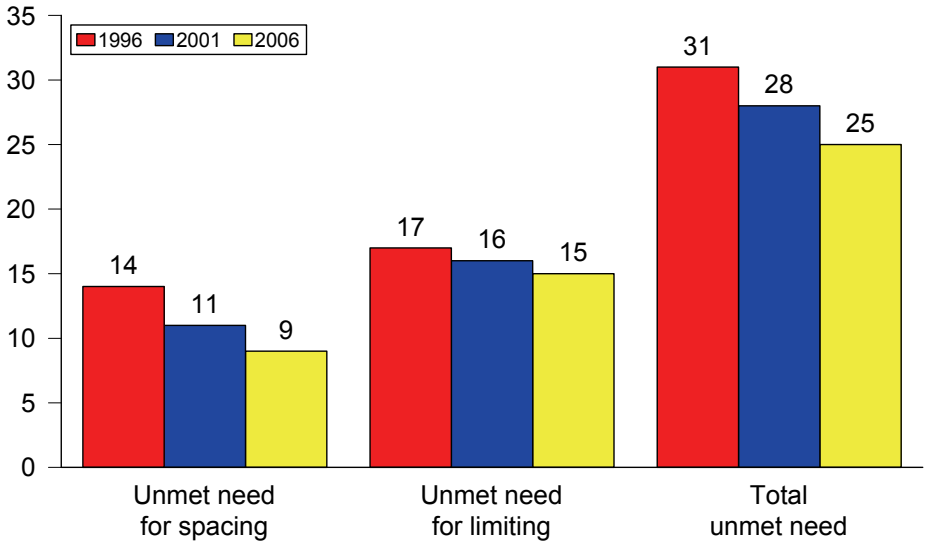
[1] 1. *Unmet need for spacing* includes pregnant women whose pregnancy was mistimed; amenorrheic women who are not using family planning and whose last birth was mistimed, or whose last birth was unwanted but now say they want more children; and fecund women who are neither pregnant nor amenorrheic, who are not using any method of family planning, and say they want to wait 2 or more years for their next birth. Also included in *unmet need for spacing* are fecund women who are not using any method of family planning and say they are unsure whether they want another child or who want another child but are unsure when to have the birth.

Unmet need for limiting refers to pregnant women whose pregnancy was unwanted; amenorrheic women who are not using family planning, whose last child was unwanted and who do not want any more children; and fecund women who are neither pregnant nor amenorrheic, who are not using any method of family planning, and who want no more children.

2. *Using for spacing* is defined as women who are using some method of family planning and say they want to have another child or are undecided whether to have another.

Using for limiting is defined as women who are using and who want no more children. Note that the specific methods used are not taken into account here.

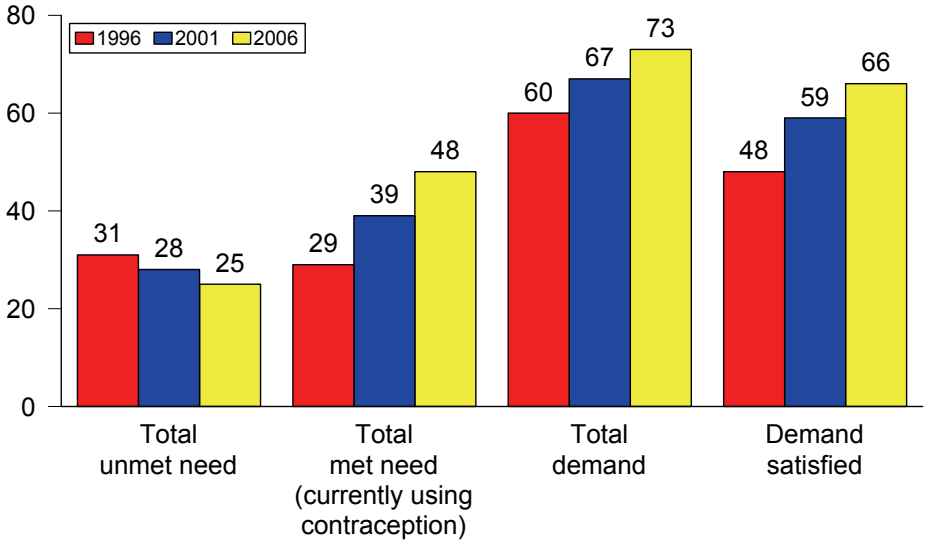
Figure 1.1 Percentage of Currently Married Women Age 15-49 with Unmet Need for Family Planning, Nepal 1996-2006



Source: NFHS 1996, NDHS 2001, and NDHS 2006

As seen in Figure 1.2, over the past decade, unmet need has gone down concomitant with an increase in the percentage of currently married women using family planning. The result is a 22 percent increase in the demand for family planning (from 60 percent to 73 percent). At the same time, demand for family planning was satisfied for one in two women in 1996, compared with two in three women in 2006. It is also important to note that women are more likely to satisfy their demand for limiting births than for spacing births, and this is consistent across all three surveys.

Figure 1.2 Percentage of Currently Married Women Age 15-49 with Unmet Need, Met Need, Total Demand, and Demand Satisfied for Family Planning, Nepal 1996-2006



Source: NFHS 1996, NDHS 2001, and NDHS 2006

Despite progress made so far in Nepal, in 2006, among currently married women who wish to plan their families, one in four continue to express a need for family planning services. This could be due to a combination of factors, such as lack of availability of the method of choice, lack of information about methods, lack of quality family planning services, and the inability to make independent decisions about family planning needs. Under these circumstances, mothers may experience unwanted pregnancies or pregnancies that occur after a short birth interval, with the consequent adverse effects on the mother's health and the health of her child. Data from the most recent DHS survey in Nepal show that an estimated six Nepalese women die each day from maternal causes, one of the highest maternal mortality rates in the world. This could in fact be an underestimate because there is little information on unsafe abortions that occur as a result of unwanted pregnancies, and are a leading cause of maternal deaths. One question related to the design of population policy in Nepal centers on the extent of unintended fertility and the amount of unsatisfied demand for fertility regulation. The extent of demand for fertility regulation is crucial in determining strategies to reduce high fertility. Although several studies in Nepal have looked at unmet need and program options for dealing with unmet need in Nepal (Pradhan and Ban, 1997; Aryal and Dangi, 1997), there is lack of comparative analysis on meeting the need for family planning. The completion of the 1996 Nepal Family Health Survey (NFHS), the 2001 Nepal Demographic and Health Survey (NDHS), and the 2006 Nepal Demographic and Health Survey (NDHS) provides this opportunity. Understanding the factors associated with unmet need for family planning in Nepal is important to identify the policy interventions that show the greatest likelihood of success. The findings of such a study will contribute to the formulation of appropriate policies to meet the challenges of providing family planning and reproductive health services to the increasing population of Nepal. The study may also assist the Nepalese government in designing appropriate programs to achieve the goal of universal access to a full range of quality reproductive health services, including family planning and sexual health services, by 2015, as set out by the International Conference on Population and Development (ICPD) Program of Action (UNFPA, 1994), and ICPD+5, (UNFPA, 1999), and the Millennium Development Goals (MDG).

2 Methodology

It is well known that women's need for family planning varies according to socioeconomic characteristics. For example, unmet need is widespread among illiterate and rural women (whose husbands are also likely to be illiterate), and women who are not exposed to various media such as radio, television, and printed materials. Higher levels of fertility are associated with lower rates of contraceptive use. Of particular concern is the limited use of contraceptive methods for spacing births. In this context, it is important to examine the factors that influence levels of met and unmet need for family planning in Nepal.

This paper examines the levels, trends, and differentials in the unmet need for family planning in Nepal and explores factors that contributed to its decline over the ten-year period from 1996 to 2006. The data for this study come from the three population-based demographic and health surveys conducted in Nepal in 1996, 2001, and 2006. Selected socioeconomic and demographic characteristics of currently married women age 15-49 are used to explore the determinants of the unmet need for family planning. The same groups of variables are then used to examine the factors associated with reducing the levels of unmet need in Nepal. A detailed description of the sampling methodology, number of respondents in each survey, and information gathered are presented in the final reports for each survey.

The first part of this study is a univariate analysis that shows the levels and trends of unmet need in Nepal, which is followed by a bivariate cross-tabulated percent distribution of currently married women of reproductive age according to selected background characteristics and the unmet need variables. The effect of each demographic and socioeconomic variable on the need for family planning—holding the effect of other characteristics constant—is examined by means of binary logistic regression to substantiate the preliminary results. The binary logistic regression analyses also

use the 1996 and 2006 NDHS pooled data to examine the factors that contributed to the observed decline in unmet need for family planning between 1996 and 2006. The outcome measures used to examine unmet need in this study are binary probabilities that a woman will belong to each of the specified categories: unmet need and other than unmet need categories, where unmet need for spacing and unmet need for limiting are "1" and the other responses, namely, no unmet need, met need for limiting, and met need for spacing, are "0". The predictor variables are all categorical and are represented by the category code.

The predicted percent distribution of women under the dichotomous need categories is tabulated for each category of demographic and socioeconomic variables, holding constant the effect of other predictor variables that are used for analyzing the multivariate results.

3 Distribution of currently married women by background characteristics

Table 3.1 shows the percent distribution of currently married women age 15-49 in 1996, 2001 and 2006, by selected background variables that are likely to influence unmet need. Rural-urban residence, ecological zones, and education of respondents are well-documented determinants of fertility and contraceptive use (Niraula and Shrestha, 1997; Pant, 1997). Accordingly, it can be assumed that unmet need for family planning for each of these groups is also likely to vary. In this context, the distribution of the sample population in the three surveys shows that, of the total population, over 85 percent live in rural areas of Nepal, and over 60 percent have no education. The number of persons in the family is also assumed to have some influence on the demand for family planning. The norm of the large family still prevails in rural areas. At the same time, the nuclear family is increasingly common in urban areas. The average family size is just over five. In this study, women are assigned to two groups, according to the size of their family: those families with five or fewer members; and those with more than five members. Family size has been shown to influence the use of family planning, and lack of privacy can be a determinant of lower use of family planning (Devi et al., 1996). The distribution of the sample population in this study indicates that about one in two women are in families that have more than five household members.

Findings from several studies in countries in south Asia have shown that the demand for additional children is influenced by the presence of sons in the family (Ali, 1989) and discrimination against girls in favor of boys (Chen et al., 1981; D'souza and Chen, 1980; Vlassoff, 1990; Stone, 1977). The economic value of a son as an important source of labor, as a source of old age security, and for the continuation of the family name, are well documented in the literature (Caldwell, 1976; Chaudhury, 1979; Gadalla et al., 1985). The DHS data for Nepal clearly show a preference for sons; however, this pattern has declined over the past decade. The average ideal number of children reported by women in 1996 was 1.67 boys compared with 1.08 girls. In 2001 the average number of boys and girls had decreased to 1.44 and 0.97, respectively, and decreased to 1.28 and 0.89, respectively, in 2006. The strong preference for sons among women in Nepal is reflected by their preference for at least two boys and one girl. The need for family planning is closely related to whether or not women have achieved the number of children they desire (ideal number). In addition, the need for family planning increases with the age of the woman. The age distribution of the sample population in all three surveys shows that about 40 percent of currently married women are in their prime reproductive years, age 20-29. The distribution of women by number of children ever born shows a slight peak among those with 2-3 children.

The need for family planning is also related to the number of living children a woman has, especially sons. The relationship between child loss and its subsequent impact on fertility has been described in the literature (Pant, 1997). Women who have lost a child tend to conceive after a shorter interval compared with women who have not experienced a child loss. In all three surveys, more than 70 percent of women have at least one living son. At the same time, 25-35 percent of women have experienced the death of at least one child.

Table 3.1 Percent distribution of currently married women age 15-49 by selected predictor variables, NFHS 1996

Variables	NFHS 1996 n=7984	NDHS 2001 n=8342	NDHS 2006 n=8257
Age			
15-19	12.1	11.2	9.5
20-24	20.1	19.7	19.4
25-29	19.5	19.5	20.2
30-34	16.2	16.5	15.3
35-39	13.0	13.2	13.7
40-44	10.4	11.2	12.3
45-49	8.7	8.8	9.6
Number of living children			
0	12.9	12.1	10.4
1	15.7	15.4	16.9
2	19.0	20.1	23.9
3	19.1	19.5	20.6
4	14.7	15.0	13.7
5	18.6	17.9	14.6
Number of living sons			
0	26.7	26.7	24.6
1	30.2	30.1	34.9
2+	43.1	43.2	40.4
Child loss experienced			
0 dead	64.8	69.8	75.2
1+ dead	35.2	30.2	24.8
Size of household			
Household with 5 or less members	37.7	41.0	48.8
Household with more than 5 members	62.3	59.0	51.2
Residence			
Urban	8.4	9.5	14.9
Rural	91.6	90.5	85.1
Ecological zone			
Mountain	6.7	6.9	7.1
Hill	42.1	41.3	41.2
Terai	51.1	51.8	51.7
Education			
No education	79.5	71.5	61.9
Primary or less	11.2	14.9	17.0
Some secondary	6.4	9.5	14.5
SLC and above	2.9	4.0	6.6
Wealth status (quintile)			
Lowest	23.3	22.6	18.6
Second	11.8	16.8	19.9
Middle	28.1	21.8	21.2
Fourth	19.1	21.1	19.9
Highest	17.6	17.7	20.5

4 Differentials in unmet need

Unmet need for contraception varies substantially according to the demographic and social characteristics of women. An examination of the differentials in unmet need will show which sub-groups of women have the greatest need for family planning. Table 4.1 shows the distribution of currently married women with unmet need for family planning for 1996, 2001, and 2006 by background characteristics.

In all three surveys, total unmet need is highest among younger women, rural women, and women who reside in the mountain zone (Table 4.1). However, the relationship between unmet need and women's education varies. Data from the surveys show that in general, as women's level of education rises, their level of unmet need increases up to the primary school level in the 1996 and 2001 surveys, and up to the secondary level in 2006, and decreases thereafter. There may be several reasons for this pattern. Unmet need is relatively lower among women with little or no education, primarily because they are less likely to express a need for family planning. As the level of education increases, women are more likely to be aware of the benefits of using contraception and thus more likely to express greater need for family planning. This, coupled with an increasing ability to access family planning services (as education increases), has resulted in a decline in unmet need among the

highly educated. The interplay between education and unmet need is also affected by the availability of the preferred method of contraception, the range of methods available, exposure to information about contraceptive methods, and the differential expectations of women across the country, especially across the three ecological zones. Some of these issues will become clearer in the multivariate analysis that follows.

Table 4.1 Percentage of currently married women with an unmet need for family planning services and its components, by background characteristics, Nepal 1996-2006

Background characteristic	Unmet need for family planning								
	1996			2001			2006		
	For spacing	For limiting	Total	For spacing	For limiting	Total	For spacing	For limiting	Total
Age									
15-19	38.9	1.6	40.5	33.4	2.2	35.6	34.7	3.2	37.9
20-24	28.8	9.0	37.8	23.8	9.4	33.2	20.4	12.5	32.9
25-29	12.9	21.6	34.6	10.8	21.0	31.9	8.6	18.2	26.8
30-34	5.3	27.0	32.3	4.1	23.2	27.2	1.2	20.2	21.4
35-39	2.3	26.8	29.1	1.1	23.2	24.3	1.2	20.9	22.1
40-44	0.8	21.4	22.2	0.5	20.5	20.9	0.3	15.7	16.0
45-49	0.1	9.1	9.2	0.0	11.5	11.5	0.1	9.9	10.0
Number of living children									
0	22.9	0.2	23.1	22.8	0.6	23.4	25.5	0.1	25.6
1	32.0	3.4	35.4	28	3.4	31.4	24.6	7.5	32.1
2	18.2	13.9	32.1	13.3	16.1	29.4	6.8	18.4	25.1
3	9.2	20.1	29.3	4.9	18.6	23.5	2.6	16.3	19.0
4	3.8	25.1	28.9	3.2	22.4	25.6	2.4	18.6	21.0
5	3.7	32.6	36.3	1.6	25.5	27.1	0.6	20.7	21.3
6+	1.8	36.0	37.8	0.4	36.7	37.1	0.7	30.0	30.7
Number of living sons									
0	26.8	3.1	29.9	24.5	4.5	28.9	22.8	3.9	26.7
1	17.7	15.5	33.2	12.7	17.1	29.8	9.4	19.2	28.6
2+	4.1	26.9	31.0	2.4	23.2	25.6	1.1	18.8	19.9
Child loss experienced									
0 dead	18.3	13.7	32.0	13.8	14.2	28.1	11.5	14.5	26.0
1+ dead	6.8	23.5	30.3	5.7	21.3	27.1	2.9	17.5	20.4
Size of household									
Household with 5 or less members	13.7	12.6	26.2	10.6	12.8	23.4	8.6	15.4	24.0
Household with more than 5 members	14.6	19.9	34.5	12.0	18.9	30.8	10.1	15.1	25.2
Residence									
Urban	7.4	14.3	21.7	6.5	9.2	15.8	7.2	12.6	19.8
Rural	14.9	17.4	32.3	11.9	17.1	29.0	9.7	15.7	25.5
Development region									
Eastern	12.2	17.1	29.3	8.8	15.3	24.1	10.0	13.6	23.6
Central	14.9	15.4	30.4	11.4	15.6	27.0	9.1	13.0	22.2
Western	13.8	20.6	34.4	11.7	18.8	30.5	10.4	22.0	32.4
Mid-western	13.5	17.8	31.4	12.8	16.6	29.4	8.4	17.1	25.6
Far-western	18.8	14.9	33.7	14.9	16.5	31.4	8.3	12.1	20.4
Ecological zone									
Mountain	13.9	20.3	34.2	9.6	22.9	32.5	10.9	19.4	30.3
Hill	14.3	18.7	33.1	11.8	18.6	30.4	8.8	19.8	28.6
Terai	14.2	15.4	29.6	11.3	13.7	25.0	9.6	11.0	20.6
Education									
No education	12.7	18.4	31.1	9.7	18.6	28.4	6.0	15.6	21.6
Primary	21.1	15.0	36.2	15.5	13.4	28.9	14.0	13.6	27.6
Some secondary	21.2	9.6	30.9	16.7	7.9	24.6	17.4	17.7	35.0
SLC and above	14.3	6.9	21.2	13.2	7.3	20.5	11.6	11.2	22.7
Wealth status (quintile)									
Lowest	15.0	17.9	32.9	11.6	22.3	33.8	10.0	22.0	32.0
Second	13.3	22.8	36.1	14.7	16.8	31.5	10.6	16.2	26.8
Middle	15.8	17.1	32.8	12.9	16.3	29.3	10.6	12.1	22.7
Fourth	15.7	16.1	31.8	10.8	13.9	24.7	10.0	13.0	23.1
Highest	9.8	13.5	23.3	6.8	11.4	18.2	5.7	13.6	19.3
Total	14.3	17.1	31.4	11.4	16.4	27.8	9.4	15.2	24.6

Overall, unmet need among women who have lost a child is lower than among women who have not lost a child. However, when data are disaggregated by need for spacing and limiting, all three surveys show increased unmet need for limiting among women who have lost a child, compared with those who have not. It is important to note here that the information on child loss is referenced to a woman's lifetime experience, which was collected at the time of the survey and is not specific to a defined period of time that would allow for a better understanding of whether a woman's current need

is related to a recent loss. A time-specific analysis would shed greater light on the true relationship between child loss and unmet need.

There appears to be a direct relationship between size of household and unmet need, with women in larger households expressing greater unmet need than women in smaller households. Unmet need is inversely related to family wealth in the 2001 and 2006 surveys, but this relationship is unclear in the 1996 survey. There is no clear relationship between number of living children and number of living sons, and unmet need.

5 Differentials in demand for family planning

Table 5.1 shows the total demand for contraception by background characteristics for the three surveys. The total demand for family planning rises with age to peak at ages 30-39 and then declines thereafter. This pattern is similar for all three surveys. In general, the demand for family planning rises with the number of living children, up to 6 or more children in 1996, 5 or more children in 2001 and 4 or more children in 2006, and then declines thereafter.

The demand for contraception is lower among women who have lost a child, and women who belong to a family that has five or fewer members. Similarly, the demand for contraception increases with the increase in the number of living sons. This pattern is consistent across all three NDHS surveys.

Demand for family planning is higher is urban than rural areas but the urban-rural gap has narrowed over the past 10 years. Demand for family planning is highest among women residing in the hills, than in the terai and mountains, a pattern that is consistent across all three surveys. There are no marked differentials by ecological zone in the demand for family planning. For the most part, the demand for family planning rises with women's level of education (the exception being among women with SLC and higher education whose demand is slightly lower than among women with secondary education, in 2006). There is a direct relationship between demands for family planning, with demand rising with wealth of women, a pattern that is consistent across the three surveys.

Table 5.1 Total demand for family planning services among currently married women, by background characteristics, Nepal 1996-2006

	Total demand for family planning								
	1996			2001			2006		
Background characteristic	For spacing	For limiting	Total	For spacing	For limiting	Total	For spacing	For limiting	Total
Age									
15-19	44.1	2.9	47.0	44.1	3.5	47.6	47.0	6.8	53.8
20-24	34.3	19.2	53.6	32.4	24.2	56.6	32.0	31.5	63.5
25-29	15.7	49.5	65.2	13.8	58.2	72.0	13.7	61.5	75.2
30-34	6.9	64.4	71.3	5.7	74.9	80.7	3.1	81.4	84.5
35-39	2.5	69.3	71.8	1.6	78.9	80.6	1.4	85.5	86.9
40-44	1.0	61.9	62.9	0.5	72.3	72.8	0.3	78.9	79.2
45-49	0.1	37.0	37.1	0.0	51.5	51.5	0.1	55.8	55.9
Number of living children									
0	25.7	0.8	26.5	29.2	1.2	30.4	33.7	0.9	34.6
1	39.5	7.6	47.1	41.4	9.6	51.0	42.3	18.9	61.2
2	21.6	41.1	62.7	16.8	55.2	72.0	9.6	70.6	80.2
3	10.7	58.2	68.9	5.9	72.7	78.6	3.4	80.8	84.2
4	4.4	67.7	72.1	3.5	77.3	80.8	2.7	78.6	81.3
5	4.1	71.1	75.2	2.2	76.7	78.9	1.1	76.1	77.1
6+	1.8	67.0	68.8	0.4	73.2	73.6	0.7	73.4	74.1
Number of living son									
0	31.6	5.4	37.0	32.4	9.9	42.3	34.6	13.5	48.0
1	21.5	36.9	58.4	17.7	50.6	68.4	14.5	62.2	76.7
2+	4.5	70.6	75.1	2.8	78.8	81.6	1.4	82.5	83.9
Number of child loss									
0 dead	21.9	39.0	60.9	18.7	48.7	67.4	17.6	56.0	73.5
1 + Dead	7.5	50.4	57.9	7.2	59.2	66.4	3.8	65.8	69.6

Continued…

Table 5.1—*Continued*

Background characteristic	Total demand for family planning								
	1996			2001			2006		
	For spacing	For limiting	Total	For spacing	For limiting	Total	For spacing	For limiting	Total
Type of family									
HH with 5 or less members	16.2	36.9	53.1	14.9	48.4	63.3	13.3	58.1	71.5
HH with more than 5 members	17.2	46.7	63.9	15.4	54.3	69.7	14.9	58.7	73.6
Residence									
Urban	14.0	57.8	71.8	14.1	63.9	78.0	15.7	64.1	79.8
Rural	17.1	41.6	58.8	15.3	50.6	66.0	13.9	57.4	71.3
Development region									
Eastern	15.3	44.8	60.1	14.2	55.6	69.8	14.8	58.8	73.6
Central	17.6	43.7	61.3	15.6	51.6	67.2	13.5	58.6	72.2
Western	15.5	45.4	60.9	14.5	52.9	67.4	14.4	58.9	73.3
Mid-western	16.8	41.4	58.2	15.3	49.9	65.2	14.5	56.6	71.1
Far-western	20.6	33.9	54.5	17.6	44.4	62.0	14.0	58.1	72.1
Ecological zone									
Mountain	16.1	36.0	52.0	12.7	51.6	64.3	14.9	53.8	68.8
Hill	17.3	45.3	62.6	15.7	51.3	67.0	14.4	59.9	74.3
Terai	16.6	42.0	58.6	15.2	52.4	67.5	13.9	57.9	71.7
Respondent's Education									
No education	14.4	43.1	57.5	11.7	53.2	65.0	8.0	62.9	70.8
Primary	24.8	42.2	67.0	21.0	49.7	70.7	19.2	53.8	73.1
Some secondary	28.6	41.9	70.5	26.2	46.9	73.1	29.2	48.8	78.0
SLC and above	26.8	46.5	73.2	29.6	48.0	77.6	25.9	49.9	75.8
Wealth quintile									
Lowest	16.9	34.4	51.3	13.6	47.4	61.0	12.2	52.6	64.8
Second	14.9	41.0	55.9	16.4	48.3	64.7	13.8	55.6	69.4
Middle	18.0	41.2	59.2	16.6	47.7	64.3	14.7	57.2	71.8
Fourth	18.4	43.8	62.2	15.3	53.2	68.5	16.2	59.7	75.9
Highest	14.6	57.6	72.3	14.3	64.8	79.1	13.6	66.6	80.2
Total	16.9	43.0	59.9	15.2	51.9	67.1	14.1	58.4	72.6

6 Differentials in family planning demand satisfaction

Table 6.1 shows the percent of total demand for contraception satisfied, which is calculated by dividing the contraceptive use rate by the sum of the total unmet need and use rate. The level of satisfaction varies widely by background characteristics. In 2006, the percentage of the total demand for contraception that is currently satisfied ranges from 30 percent for women age 15-19 to 82 percent for older age 45-49. As age increases, the percentage of demand satisfied increases indicating the positive relationship between age and demand satisfaction. A similar relationship was found in the 1996 and 2001 surveys. The demand satisfied is higher in urban areas compared with rural areas. Similarly, demand satisfied is higher among women in the terai region compared with their hill and mountain counterparts. Among development regions, the demand satisfied in 2006 is higher in the Farwestern region compared with other regions. However, the situation is different in 1996 and 2001. The demand satisfied is higher in the Eastern region and lower in the Farwestern region. Data from the 1996 and 2001 surveys show that as women's education level rises they are more likely to be able to satisfy their demand for contraception. However, in 2006, the relationship between women's level of education and demand satisfied is U-shaped, being highest among those with no education or SLC and higher level of education higher among those with primary education and lower among those with some secondary education. Women who have three children have the highest levels of demand satisfied in both 2001 and 2006 surveys, but in 1996 demand satisfied is highest (60 percent) only at parity 4. The positive relationship between demand satisfied and number of living sons is also observed. Demand satisfied among women who belong to a large family is lower than among those who belong to a family with an average household size of five or fewer family members. The relationship between level of satisfaction and wealth is positive.

Table 6.1 Percentage of demand satisfied for family planning services, among currently married women, by background characteristics, Nepal 1996-2006

Background characteristic	% of demand satisfied for family planning								
	1996			2001			2006		
	For spacing	For limiting	Total	For spacing	For limiting	Total	For spacing	For limiting	Total
Age									
15-19	12.0	44.8	13.9	24.3	34.3	25.2	26.2	54.4	29.6
20-24	16.0	53.1	29.4	26.5	61.2	41.4	36.3	60.3	48.2
25-29	17.8	56.4	47.0	21.0	63.9	55.7	37.2	70.4	64.4
30-34	24.6	58.1	54.7	29.8	69.2	66.3	61.3	75.2	74.7
35-39	8.0	61.3	59.5	31.3	70.6	69.8	14.3	75.6	74.6
40-44	20.0	65.4	64.6	0.0	71.8	71.3	0.0	80.1	79.8
45-49	0.0	75.4	75.3	0.0	77.7	77.7	0.0	82.3	82.1
Number of living children									
0	10.9	75.0	12.8	21.9	50.0	23.0	24.3	77.8	31.7
1	19.0	55.3	24.8	32.4	64.6	38.4	41.8	59.8	47.8
2	15.7	66.2	48.8	20.8	70.8	59.2	30.2	73.9	68.2
3	14.0	65.5	57.5	16.9	74.4	70.1	23.5	79.8	76.6
4	13.6	62.9	59.9	8.6	71.0	68.3	14.8	76.2	73.8
5	9.8	54.1	51.7	27.3	66.8	65.7	45.5	72.8	69.7
6+	0.0	46.3	45.1	0.0	49.9	49.6	0.0	59.1	57.5
Number of living son									
0	15.3	42.2	19.2	24.5	54.5	31.5	34.0	71.2	44.4
1	17.8	57.9	43.1	28.5	66.2	56.4	34.9	69.2	62.7
2+	8.4	61.9	58.7	14.9	70.5	68.6	19.6	77.3	76.3
Number of child loss									
0 dead	16.5	65.0	47.5	25.9	70.8	58.4	34.4	74.1	64.6
1 + Dead	9.9	53.4	47.8	20.4	64.0	59.2	24.4	73.4	70.7
Type of family									
HH with 5 or less members	15.8	65.9	50.6	29.1	73.6	63.1	35.4	73.5	66.4
HH with more than 5 members	15.3	57.5	46.1	22.5	65.2	55.8	32.4	74.3	65.8
Residence									
Urban	46.4	75.3	69.8	53.2	85.6	79.8	53.5	80.3	75.2
Rural	12.9	58.4	45.1	22.2	66.2	56.0	29.5	72.6	64.3
Development region									
Eastern	20.9	61.8	51.3	38.7	72.5	65.6	32.4	76.9	67.9
Central	15.3	64.8	50.5	26.9	69.8	59.8	32.6	77.8	69.3
Western	11.0	54.6	43.5	19.3	64.5	54.8	27.8	62.6	55.8
Mid-western	19.6	57.0	46.1	15.7	66.7	54.9	42.1	69.6	64.0
Far-western	8.7	56.0	38.1	15.3	62.8	49.4	40.7	79.3	71.7
Ecological zone									
Mountain	13.7	43.3	34.2	23.6	55.6	49.4	27.5	63.9	56.0
Hill	17.3	58.7	47.2	24.8	63.7	54.6	38.2	66.9	61.5
Terai	13.9	63.6	49.5	25.7	73.7	62.9	30.9	80.8	71.2
Respondent's Education									
No education	11.8	57.3	45.9	17.1	65.0	56.3	25.0	75.2	69.6
Primary	14.9	64.5	46.0	26.2	73.2	59.1	27.1	74.9	62.2
Some secondary	25.9	77.1	56.2	36.3	83.2	66.4	40.4	63.7	55.1
SLC and above	46.3	85.2	71.1	55.4	85.0	73.6	55.2	77.6	70.0
Wealth quintile									
Lowest	11.1	48.0	35.8	14.8	53.0	44.5	18.0	58.4	50.7
Second	10.6	44.4	35.4	10.4	65.1	51.2	23.2	70.9	61.4
Middle	12.4	58.6	44.5	22.2	65.7	54.5	27.9	78.8	68.4
Fourth	14.3	63.3	48.8	29.6	73.8	63.9	38.3	78.1	69.6
Highest	33.0	76.6	67.7	52.6	82.4	77.0	58.8	79.4	75.9
Total	15.4	60.2	47.6	25.0	68.4	58.6	34.0	74.0	66.1

7 Determinants of change in unmet need between 1996 and 2006

Although there has been a marked decline in unmet need for family planning in Nepal during the last decade, it is still not clear what accounts for this decline. Preliminary analyses in the preceding section show that in all three surveys, the relationship is not uniform between unmet need and selected variables such as number of living children, development regions and education. The need for family planning is influenced by changes in the factors that impact reproductive behavior. For example, changes in a mother's age at childbearing, the number of children she has, and the interval between births all impact the pattern of unmet need over the years. In addition, changing socioeconomic characteristics and its impact on unmet need can also vary over time. Previous studies on this topic have not attempted to quantify the contribution of factors that may have had an impact on reducing the unmet need for family planning in Nepal. In addition, previous studies have also not

examined in greater detail the impact of changes in the socioeconomic, health and demographic factors on the unmet need for family planning,

The univariate and bivariate analyses confirmed the changing levels of unmet need over the past decade and the differential impact of socioeconomic, demographic and health-related variables on this changing unmet need. However, it is not clear what accounts for the decline in unmet need for family planning over the past decade. This will be the focus of the subsequent analysis into the determinants of unmet need. The analysis is based on multivariate logistic regression that explores factors that explain the decline in the unmet need followed by a discussion of whether the decline is due to the differential impact of variables in the two surveys or whether it is due to the change in the structural relationship between unmet need and the explanatory variables.

To examine the role of each independent variable in determining the decline in unmet need for family planning, two perspectives are employed in the analysis: 'fixed structure' and 'changing structure' by DaVanzo and Habicht (1986: 147). Fixed structure analysis is based on the assumption that the decline in unmet need for family planning observed between 1996 and 2006 is due to changes in the values of the explanatory variables per se and not to changes in the relationship between these variables and unmet need. This model assumes a change in unmet need brought on by a change in the representative value of an explanatory variable. It addresses the question of how an increase in the proportion of women with some education between 1996 and 2006, for example, impacts unmet need. Therefore, changes in the covariates are not considered in this model. The changing structure analysis, in contrast, is based on the assumption that the change in unmet need over time is due to a change in the relationship between the dependent and explanatory variables (structure). This model assumes a change in unmet need brought on by a change in the relationship between explanatory variables and outcome variables over time. For example, in 1996 and 2001, unmet need was highest among women with primary education; but in 2006 unmet need was highest among women with some secondary education. This pattern of relationship is not the same. A change in the unmet need thus can be explained by both types of change.

For the 'fixed structure' analysis, a logit regression model is fitted to the pooled data from the 1996 NFHS and 2006 NDHS, to quantify the role of change in the explanatory variable in explaining the change in the probability of unmet need for family planning, which is implied by the logit coefficients evaluated at the sample mean probabilities. To assess the role of the structural change in unmet need, firstly it is important to know which of the coefficients have changed between the two periods. For this purpose a logit model that allows for the different coefficients for the two time periods is fitted to the pooled data set. The logit regression that interact each independent variable with the 2006 dummy, based on the pooled data, yields the logit coefficients and corresponding t-statistics that indicate whether the changes in structure that took place between the two points of time are significantly different from zero. This part of the analysis helps in identifying the influence on unmet need of the relationship of each factor that has changed during the two points of time. In addition, the difference in the intercept term explains whether factors that are not considered in the model have changed significantly.

The third set of analysis examines the average of the predicted probabilities for each individual, calculated as $P_i = 1/(1 + e^{-logit_i})$ is compared with the actual average probability of occurrence in order to examine the role of change in the values of the variables versus the change in the structure in explaining the decline in unmet need for family planning between the periods covered by this study (Preston, 1980; 1975a; DaVanzo and Habicht, 1986; Merrick, 1985).

8 Role of change in variable values in explaining the decline in the unmet need for family planning

Table 8.1 shows the role of shifts in the values of variables in explaining the decline in unmet need for family planning observed between 1996 and 2006 periods. The results in Table 6 are based

on the assumption that the structure of the relationship between the variables during the period considered in the study is unchanged. The first two columns of Table 9.1 show the means of each independent variable of interest. The third column shows the actual change that took place in each of these factors between the two time periods, and the corresponding t-statistics, indicating whether the change that occurred is significant. The results in the third column indicate clearly that the change in the mean values of all factors, with the exception of development region, ecological zone and wealth quintile, are significant.

The unmet need for family planning during 1996 and 2006 has declined by about 22 percent. During the same period fertility declined sharply and has contributed to women reporting relatively fewer surviving children, fewer living sons, and fewer child deaths in 2006 as compared with 1996. With regard to other socioeconomic factors, for example, the proportion of women with some education, the proportion living in urban areas, and the proportion who belong to a family with five or fewer members has increased, with the changes observed to be statistically significant.

Table 8.1 Results of logit regression explaining unmet need and decomposition of the differences in unmet need for family planning for the periods 1996 and 2006, Nepal

Explanatory variables	Mean NFHS 1996 N=7978	Mean NDHS 2006 N=8224	Mean Difference (Mean 2006 - mean 1996) (t-stat)	Pooled logit Coefficient (t-stat)	Differences in unmet due to change in variable value
Age (years)	30.24	30.87	0.632 (4.48)	-0.107 (-28.99)	-1.92
Number of living children	2.81	2.66	-0.146 (-4.91)	0.345 (19.38)	-1.43
Number of living son	1.44	1.34	-0.101 (-5.38)	0.009 (0.43)	-0.03
Number of child loss	0.64	0.38	-0.260 (-17.05)	0.162 (7.55)	-1.20
Type of family [D] with 5 or less members (more than 5 member)	0.37	0.49	0.113 (14.66)	-0.033 (-0.84)	-0.11
Place of residence [D] Urban (rural)	0.11	0.26	0.151 (25.17)	-0.163 (-3.01)	-0.70
Development region [D] Eastern/Central/Mid-western/Far-western (Western)	0.81	0.80	-0.006 (-0.95)	-0.324 (-6.96)	0.05
Ecological region: [D] Hill/Terai (Mountain)	0.87	0.87	-0.008 (-1.51)	-0.249 (-4.62)	0.06
Respondent's Education [D] Some education (no education)	0.21	0.39	0.179 (25.56)	0.204 (4.57)	1.04
Wealth quintile	3.02	2.99	-0.025 (-1.11)	-0.095 (-6.44)	0.07
Intercept				1.927652 (17.36)	
χ 2 (df)				1363 (10)	
Unmet need % (Mean dependant)	31.39	25.61	(-8.17)	Sum of entries	-4.16
($\partial p/\partial x$)			0.285		

Actual difference in unmet need between 1997 and 2006 = 31.39 – 25.61 = 5.78
Explained differences= 4.16 Percent explained= 71.97

Notes: Figures in parentheses in the first column indicate reference category and in other columns t-statistics.
[D] Indicate dichotomous variables.
a/ This column is calculated as ($\partial p/\partial x$) * (mean difference) * (Logit coefficient) * (1000).
Data sources: 1996 NFHS and 2006 NDHS data tapes.

The fourth column of Table 8.1 shows the logit regression coefficients, which explain the relationship between unmet need and the explanatory variables of interest, after controlling for the effects of other factors in the model. For example, unmet need for family planning decreases with

women's age and wealth. Similarly unmet need for family planning is lower among women who belong to a small family, among urban women and among those who reside in other than the Far-western region. In contrast, unmet need for family planning increases with the increase in education, number of living children, and number of child losses. In most cases the relationship between unmet need and the predictor variables are as expected.

The fifth column of Table 8.1 quantifies the amount of decline in unmet need due to the change in the values of explanatory variables over time. The value corresponding to the 'sum of entries' at the bottom of the fifth column of Table 8.1 is derived by adding all entries of the column. This suggests that 4.16 of the decline of 5.78 in unmet need during the period 1996 and 2006 is explained by the change over time in the values of the factors considered in this study. In other words, 72 percent of the total decline in unmet need over the past ten years can be attributed to a change in the values of the explanatory variables used in the study and not from a change in the relationship between unmet need and these same variables. The analysis also indicates that changes in the age distribution of women, number of living children, and child loss experience, account for a sizeable contribution to the overall decline in unmet need for family planning in Nepal observed between 1996 and 2006. In contrast, the increase in the proportion of women with some education, and the decrease in the proportion of women with no education have contributed to the increase in unmet need. This increase would be due to the ability of educated women to demand more choices in methods of family planning which service providers are not able to deliver.

9 Role of change in structure in explaining the decline in the unmet need for family planning

Table 9.1 shows the coefficients of the independent variables considered in the model that have changed between the two periods. The second and third columns of Table 9.1 show the logit coefficients and corresponding t-statistics according to the independent variables of interest for the period 1996 and 2006 respectively, after controlling for the effects of other factors considered in the model. These results are based on logit regression models which allow coefficients to differ between the 1996 and 2006 periods. Figures in the fourth column of Table 9.1, which are calculated by interacting each explanatory variable with the 2006 dummy, show the size and significance of the change in the coefficients that took place between the two periods.

The results in this column suggest that among the coefficients (structure) pertaining to variables considered in this study, coefficients pertaining to age of women, number of living children a woman has had, child loss experience, urban-rural place of residence (urban/rural), education and wealth quintile have changed between the two periods and are significantly different from zero [two-tailed test $|t| > 1.96$]. This indicates that the relationships of these six variables out of the ten factors considered in this study with the unmet need for family planning have changed significantly during the two periods of time. However, the large change in the intercept term, shown to be statistically significant, suggests that the relationship between factors that are not considered in this study with unmet need during the same span of time has also changed considerably.

The last column of Table 9.1 shows that structural change in the age of women, urban residence, and women's education has contributed to the observed decline in unmet need. In contrast, the increase in the number of living children, the increase in child loss experience, and the increase in household wealth among women have all contributed to the increase in unmet need. The change in the structural relationship of the remaining variables in Table 9.1 do not significantly contribute to an increase or decrease in the unmet need observed between 1996 and 2006.

Table 9.1 Results of logit regression explaining unmet need for family planning, allowing for different coefficients for the periods 1996 and 2006, Nepal.

Explanatory variables	Logit coefficient 1996 N=7978 (t-stat)	Logit coefficient 2006 N=8224 (t-stat)	Differences in the coefficients of 1996 and 2006
Age (years)	-0.126 (-23.04)	-0.082 (-16.09)	0.044 (5.85)
Number of living children	0.406 (16.16)	0.269 (10.48)	-0.137 (-3.82)
Number of living son	0.027 (0.88)	-0.028 (-0.87)	-0.055 (-1.24)
Number of child loss	0.203 (7.40)	0.070 (1.85)	-0.133 (-2.86)
Type of family [D] with 5 or less members (more than 5 member)	-0.095 (-1.66)	0.050 (0.90)	0.145 (1.82)
Place of residence [D] Urban (rural)	-0.274 (-2.85)	-0.015 (-0.22)	0.259 (2.20)
Development region [D] Eastern/Central/Mid-western/Far-western (Western)	-0.243 (-3.68)	-0.414 (-6.23)	-0.172 (-1.84)
Ecological region: [D] Hill/Terai (Mountain)	-0.213 (-2.75)	-0.256 (-3.36)	-0.043 (-0.39)
Respondent's Education [D] Some education (no education)	0.105 (1.52)	0.362 (5.82)	0.257 (2.76)
Wealth quintile	-0.063 (-3.06)	-0.172 (-7.78)	-0.109 (-3.60)
intercept	2.191 (13.69)	1.563 (9.92)	-0.628 (30.81)
χ 2 (df)	75.01 (10)		
Average dependant	31.39	25.61	

Notes: Figures in parentheses indicate t-statistics.
[D] Indicate dichotomous variables.
Data sources: 1996 NFHS and 2006 NDHS data tapes

Table 9.2 also shows the relative importance of the role of change in the variable values as against the shift in the structure of the relationship between the period 1996 and 2006 in explaining the decline in unmet need for family planning. The results in Table 9.2 show the extent to which the 1996 coefficients and 2006 values of explanatory variables predict the 2006 unmet need for family planning, and vice versa. The calculation is based on the predicted logit for each observation which is converted to a probability using the formula $P_i = 1/(1 + e^{-logit_i})$, and then averaged over observations for that period. The difference between the predicted unmet need based on the 1996 coefficients and the 2006 variable values and the actual 1996 rate is the proportion of unmet need decline attributed to change in the variable values. By contrast, the difference between the predicted unmet need based on the 1996 coefficients and 2006 variable values and the actual 2006 outcomes is the proportion of decline attributed to the change in the structure (Preston, 1975; 1980; DaVanzo and Habicht, 1986).

Table 9.2 Predicted unmet need (percent) using 1996 coefficients and 2006 variable values and vice versa, Nepal

	Predicted unmet need (%) based on the 1996 variable values	Predicted unmet need (%) based on the 2006 variable values	Estimated change due to change in values of explanatory variables
Predicted unmet need using 1996 coeff	31.39	25.90	5.49
Predicted unmet need using 2006 coeff	27.45	25.61	1.84
Estimated change due to shift in relationship	3.94	0.29	5.78++

Notes: Predicted average unmet need probability for each period is the average of predicted probabilities for each individual, each calculated as $P_i = 1/(1+e^{-logit_i})$.
++: (Total observed decline in unmet need between 1996-2006=(31.39-25.61) = 5.78
Sources: 1996 NFHS and 2006 NDHS data tapes.

The values in the first and second columns in the last row of Table 9.2 suggest that the decline in unmet need for family planning during the periods 1996 and 2006 explained by the change in the structure of the relationship is lower than the decline explained by the change in the value of variables (first and second row of last column). Much of the decline thus is explained by the change in the value of variables. For example, when the coefficients for the period 1996 were applied to the 2006 values of the explanatory variables, the unmet need for family planning declined from 31.39 in 1996 to 25.90 in 2006. This suggests that the predicted unmet need for the period 2006 was 0.29 points higher than the observed unmet need for family planning. Similarly, when the 2006 coefficients were applied to the 1996 variable values to predict the unmet need for family planning for the period 1996, the decline in unmet need for family planning due to the shift in the variable values is 1.84 points lower. The decline explained by the shift in the values of variables ranges between 32 and 95 percent of the total 5.78 unmet need points decline that took place between the two periods, as against 5 to 68 percent explained by the shift in the relationship. This suggests that changes in the value of explanatory variables (fixed structure) are more important in explaining the decline in unmet need than the change in the relationship between explanatory variables (changing structure).

10 Summary of findings and policy implications

The differential analysis shows that total unmet need is highest among younger women and among rural women. All three surveys also show that women in the mountain have higher unmet need compared with their hill and terai counterparts. The analysis also shows that in 2006, as women's education increases, unmet need also increases up to the secondary level, and then decreases at the SLC level and above. The overall unmet need among women who have lost a child is higher as compared with those who have not lost a child born to them. However, when data is disaggregated by unmet need for spacing and unmet need for limiting, all three surveys show increased unmet need for limiting among women who have lost a child than their counterpart who have not lost a child.

The unmet need among women who belong to big family is relatively higher than those who belong to a family with national average or less than national average family member size household. The 2001 NDHS and the 2006 NDHS data show that unmet need decreases with the increase in the wealth.

The data also reveal that the high level of total demand for contraception varies little by women's background characteristics, with the exception of women who have lost a child, women who belong to a family that has five or fewer family members. Similarly, demand for contraception increases with the increase in the number of living sons and with an increase in wealth. This pattern is consistent across all three NDHS surveys.

The examination of predictor variables on unmet need for family planning provides additional insights and understanding of the problem. For example, the unmet need for family planning decreases steadily with increasing age of women. A similar pattern emerges for number of living children, living sons and child loss experience. Women in families with more family members, women with relatively lower level of education, women who live in the mountains, rural areas and in the Western development regions were found to have higher unmet need than their counterparts. Increase in the level of education is clearly associated with declining unmet need.

The results also show some differences in the patterns of relationship between unmet need and the demand for family planning across different categories of the variables considered. For example, the total need for family planning in most of the instances did not appear to be in line with the observation of the unmet need. This result could be due to the reason that women who are better off socioeconomically are more likely to be able to satisfy their contraceptive demand on their own whenever they needed. In contrast, binary logistic regression shows that those who belong to relatively weaker socioeconomic groups are less likely to be using family planning even when they wanted or expressed their desire to use it. The multivariate analysis also produced similar results showing that the percentage of unmet need is higher among younger women and, those with less than one living child and with more than five living children as compared with those in the other categories of the respective variables. These differences by selected socioeconomic background characteristics of the women show that the percentage of total need that is unmet among women from rural areas, from the mountain zone, among women with no education and among those in households that have more than five family members as compared with their counterparts was higher.

The effects of almost all of the factors that were found to be important in the 1996 period was still important in 2006, except that in some case the effects attenuates from significant to insignificant. In addition, the effects of some of the variables even becomes sharper after controlling for the effects of other factors than in the case where such control was not taken into account.

Fixed structure analysis shows that the change in the mean values of all factors between 1996 and 2006, except development region, ecological zone and wealth quintile, are significant. The analysis further shows that, between 1996 and 2006 changes over time in the values of factors considered in this study accounted for nearly three-quarters of the total decline in unmet need. Furthermore, the analysis also shows that changes in the average age of women, number of living children, education, and child loss experience are the most important factors contributing to the overall decline in unmet need for family planning between 1996 and 2006.

Changing structure analysis, by contrast, shows that age of women, number of living children a woman have, child loss experience, place of residence, education and wealth quintile have changed between the two periods and are significantly different from zero [two-tailed test $|t| > 1.96$]. This indicates that the relationships of these six out of ten factors considered in this study with the unmet need for family planning have changed significantly during the two periods of time. However, only women's age, urban residence, and women's education have contributed to the observed decline in the unmet need, while the increase in the number of living children, the increase in the child loss experience, and the increase in household wealth have contributed to the increase in unmet need.

The analysis carried out focusing on the relative importance of the role of change in the variable values as against the shift in the structure of the relationship between the period 1996 and 2006 in explaining the decline in unmet need for family show that the decline in unmet need for family planning during the periods 1996 and 2006 explained by the change in the structure of the relationship is lower than the decline explained by the change in the value of variables and that much of the decline thus is explained by the change in the value of variables. The decline explained by the shift in the values of variables ranges between 32 and 95 percent of the total 5.78 unmet need points decline that took place between the two periods, as against 5 to 68 percent explained by the shift in the relationship.

11 Policy implication

The overall finding of this study clearly indicates that the need for family planning, and especially the need for spacing methods, is largely unmet. Nepal's family planning program could benefit from a greater emphasis in serving the need of spacers without reducing the focus on continuing to provide limiting methods. The increasing popularity of injectables in recent years is a positive sign. In addition, greater emphasis on the use of condom, IUD and other spacing methods can further reduce the gap in unmet need for family planning in the country.

The research findings clearly point to the need for improving access to and quality of family planning services in Nepal. The NDHS 2006 data show that some of the reasons for nonuse are directly related to women's misconception about family planning (women think family planning is only for use once women have reached their desired family size) and shortfalls in the existing family planning program in the country. To minimize misconception about family planning, specific advocacy and IEC strategies should be developed to better educate women. Similar policy recommendations were also reported by Aryal and Dangi in their study in 1997.

Women need to be counseled on the full range of available contraceptive methods so that they can choose the method they like, understand side effects associated with each method, understand the risks associated with pregnancy among women who are postpartum, breastfeeding or approaching menopause. In addition, the relationship between service providers and clients should be enhanced and developed. It is also argued that if family planning programs served most women with unmet need, the demographic impact would be substantial. In Nepal if all married women with unmet need were to use contraception, contraceptive prevalence rate would rise even above program goals set to achieve replacement level fertility.

To meet unmet need national commitment is more important than economic development (Population Reports, 1996). National family planning program effort should be much stronger to address the unmet need of the country. It is also well documented that focusing on men as well as women is crucial to meeting unmet need. In Nepal husbands often influence their wives' reproductive attitudes and participate in decisions pertaining to contraceptive use. Similarly, linking family planning with other health related services is also important to reduce unmet need. It is recommended that the reasons for non use should be understood and addressed effectively and that government and other stakeholders working in population and health sectors should initiate appropriate strategies for program strengthening. Reducing unmet need for family planning is important for achieving both demographic goals and enhancing individual rights.

One of the steps towards developing strategies to address unmet need is to identify the reasons for nonuse and it is hoped that the findings in this research will provide information for developing appropriate target-specific strategies that can be monitored and evaluated periodically.

References

Pradhan, A. and B. Ban. (1997) 'Program options to meet unmet need', In **Insights on Family Health Issues in Nepal,** Calverton, Maryland, USA: Macro International Inc.

Ali, M.S. (1989) 'Does son preference matters?' ***Journal of Biosocial Science,*** 21: 399-408.

Aryal, R.H. and T.B. Dangi. (1997) 'Program options to meet unmet need', In **Insights on Family Health Issues in Nepal,** Calverton, Maryland, USA: Macro International Inc.

Caldwell, J.C. (1976) 'Towards a restatement of demographic transition theory', ***Population and Development Review,*** 2 (3-4): 321-66.

Caldwell, J.C. (1979) 'Education as a factor in mortality decline, an examination of Nigerian data', ***Population Studies***, 33 (3): 395-413.

Caldwell, J.C., P.H. Reddy, and P. Caldwell. (1983) 'The social component of mortality decline: an investigation in South India employing alternative methodologies', ***Population Studies***, 37: 185-205.

Chen, L.C., E. Haq, and S. D'souza. (1981) 'Sex bias in the family allocation of food and health care in rural Bangladesh', ***Population and development Review***, 7 (1) 55-70.

Choudhury, R.H. (1979) 'Socio-cultural factors affecting practices of contraception in metropolitan urban areas of Bangladesh', ***Demography India***, 8: 127-53.

DaVanzo, J. and P.J. Habicht. (1986) 'Infant mortality decline in Malaysia 1946-1975: the roles of change in variables and change in the structure of relationship', ***Demography***, 23(2): 143-160.

Devi, D.R., S.R. Rastogi, and R.D. Retherdford. (1996) 'Unmet need for family planning in Utter Pradesh', ***National Family Health Survey Subject Reports, No 1***., Bombay: International Institute for Population Science and Honolulu East-West Center Programme on Population.

D'souza, S. and L.C. Chen. (1980) 'Sex differentials in mortality in rural Bangladesh', ***Population and Development Review***, 6 (2): 257-270.

Gadalla, S., J. McGathy, and O. Campbell. (1985) 'How the number of living sons influences contraceptives use in Menoufia Governorate, Egypt', ***Studies in Family Planning***, 16: 164-69.

Merrick, T.W. (1985) 'The effect of piped water on early childhood mortality in urban Brazil, 1970 to 1976', ***Demography***, 22(1): 1-23.

Ministry of Health [Nepal], New ERA, and ORC Macro. (2002) '**Nepal Demographic and Health Survey 2001',** Calverton, Maryland, USA: Family Health Division, Ministry of Health; New ERA; and ORC Macro.

Ministry of Health and Population (MOHP) [Nepal], New ERA, and Macro International Inc. (2007) '**Nepal Demographic and Health Survey 2006',** Kathmandu, Nepal: Ministry of Health and Population; New ERA; and Macro International Inc.

Niraula, B.B and D.P. Shrestha. (1997) 'Does caste/ethnicity matters in fertility transition? An analysis of Nepalese data', **Nepal Population Journal**, 6 (5): 13-40.

Pant, P.D. (1997) 'Effects of child loss experience on subsequent fertility in Nepal', ***The Economic Journal of Nepal,*** 21(1): 1-16.

Pradhan, A., R.H. Aryal, G. Regmi, B. Ban, and P. Govindasamy. (1997) '**Nepal Family Health Survey 1996**', Kathmandu, Nepal and Calverton, Maryland: Ministry of Health [Nepal], New ERA, and Macro International Inc.

Preston, S.H. (1975) 'The changing relation between mortality and level of economic development', ***Population Studies***, 29(2): 231-248.

Preston, S.H. (1980) 'Causes and consequences of mortality decline in less developed countries during the twentieth century', pp. 289-360, In ***Population and economic change in developing countries***, ed. R.A. Easterlin. Chicago and London: University of Chicago Press.

Stone, L. (1977) 'Cultural repercussions of childlessness and low fertility in Nepal', ***Contribution to Nepalese Studies, Research Centre for Nepal and Asian Studies***, 5 (2): 7-38.

Tuladhar, J.M. (1987) 'Effect of family planning availability and accessibility on contraceptive use in Nepal', ***Studies in Family Planning***, 18(1): 49-53.

UNFPA. (1994) '***Programme of Action Adopted at the International Conference on Population and Development'*,** Cairo: UNFPA.

UNFPA. (1999) '**Further Implementation of Programme of Action, ICPD+5',** New York: UNFPA.

Vlassoff, C. (1990) 'The value of sons in an Indian village: how widows see it', ***Population Studies***, 44: 5-20.