

## PROGRESS OF FAMILY PLANNING PROGRAM OF INDIA

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### Abstract

*The purpose of this study is to investigate the relationship between socioeconomic development and knowledge, attitude and practice (KAP) of family planning in India. This study tests the following major hypothesis: The higher the level of socioeconomic development, the more extensive the KAP of family planning will be among the states of India. The study applies correlation and multiple regression analysis of data from the National Family Health Survey (NFHS), India: 1998-1999 using level of development to predict three major categories (KAP) of family planning. The findings support the hypothesis in large measure, revealing that the overall socioeconomic development is directly related to the KAP of family planning among the states of India.* **Key-words:** Knowledge, attitude and practice of family planning; socio-economic conditions; India.

### Introduction

With more than 1 billion people, India is the world's second most populous country, comprising 17.1 percent of the world's population. The 2001 Census of India reported a population of 1,029 million. During the last single decade (1991-2001), the population increased by 182 million, or 21.6 percent (India, Registrar General and Census Commissioner, 2002). In 2008, only 7 years after its last census, India had added another 120 million people, bringing the total population to 1,149 million. Even though the government of India has provided information about the benefits of small families, the total fertility rate (TFR) of the country is 2.8 and the growth rate is 1.6 percent per year. India's population is projected to reach 1.4 billion by 2025 (Population Reference Bureau, 2008).

Among the developing countries, India was a pioneer in the international movement to control population growth. The government adopted a national population policy of fertility control as an integral part of its national developmental plan. The official recognition of the problem came with the publication of the first Five-year Plan (India, Planning Commission, 1953), which went into effect in 1951. Since implementing the program, ten five-year plans have been completed, and the eleventh is underway. Unfortunately, the family planning program has not met with the success expected. Since the late 1950s, social researchers have conducted many extensive surveys in the areas of knowledge, attitude and practice (KAP) of family planning at the cross-national and sub-national levels in developing countries

such as India. This area has generated a number of scholarly and popular articles, including three major reviews of KAP literature by Berelson (1966), Mauldin (1965) and Acsadi (1974).

In an attempt to evaluate the performance of the family planning programs in the developing world, Freedman (1990) divided these countries into three categories: (1) less developed countries with rapid development, such as Korea, Taiwan and Singapore, (2) countries with moderate development, such as China, Indonesia and Thailand and (3) countries with relatively little development and a weak infrastructure, such as India, Pakistan and Bangladesh. Although many of the countries in the third category have family planning programs, they have not been very successful in promoting acceptance of contraceptive use or reducing fertility. According to Freedman, the reasons for this lack of success are the low standards of living and weak family planning systems with poor-quality services provided in ways that are inappropriate for the societal culture. The limited success led to a change in approach, a theme at the International Conference on Population and Development held in Cairo in 1994, which endorsed a strategy that stressed the relationship between population and development, focusing more on meeting the needs of individual women and men. (Vlassoff, 1999). During 1992-98 there were a number of program shifts in the administration of family welfare in India.

The initial problem faced by the government of India was trying to promote family planning in a nation that was largely poor while family planning had traditionally been associated with a high standard of living. It appears that when people are accustomed to a high standard of living, they are inclined to limit family size in order to maintain this standard of living. However, in the case of India, for a majority of the population, the standard of living is low. Consequently, the country faces a dilemma. Whereas population control is critically needed to check the decline in the already low standard of living, the successful practice of family planning may require a higher standard of living than is now the case (Chandrasekhar, 1967). Therefore an attempt is made in this study to investigate the relationship between the level of development and the knowledge, attitude and practice of family planning among the states of India.

### **Literature Review and Hypothesis**

In the past two centuries fertility and mortality decline in Europe, and later elsewhere, were largely the result of economic and social development. In the wake of this development came the rapid decline in mortality. With more children surviving, fewer births were needed to achieve a given family size or rate of population increase. The rising cost of living and diminished economic utility of children

in urban and industrial environments provided additional motivation for family limitation. The rising status of women through the extension of educational opportunities and employment in occupations formerly reserved for males contributed to the widening practice of family limitation. Finally, along with industrialization and modernization came the development of a more secular, rational attitude favoring the voluntary control of fertility (Caldwell, 1982; Teitelbaum, 1975; World Bank, 1984).

A number of studies have sought to clarify the complex relationship between socioeconomic development and fertility in developed and developing countries. Economic development, such as an increase in gross national product, higher per capita income and urbanization of a society, has a significant inhibiting effect on fertility (United Nations 1990 and 1995). Economic development allows for an improved standard of living and higher aspirations for children and parents. In a developed society, the economic value and benefits of children decrease, resulting in lower fertility (Freedman, 1979). Rao and Somayajulu (1999) interviewed 100 couples who had recently undergone sterilization after having one child and found that the primary factor in the decision was avoiding socioeconomic deprivation. The desire for a better life for their child, coupled with the efforts of family planning workers contributed significantly to the decision to practice family plan-

ning. The sex of the child was not a significant factor. Some variables indicating economic development, such as availability of water, electricity and toilet facilities, also affect fertility directly or indirectly through their impact on mortality. Regular exposure to the mass media, especially radio and television, influences family planning attitudes and behavior, which in turn affects fertility (Westoff and Bankole, 1999).

The economic activity of women with some education is also considered an important factor in reducing fertility (Chaudhury, 1996). An increase in labor force participation rates enhances the status and power of women, which in turn motivates them to limit fertility. The earning capacity of women is expected to bring them economic independence, which ultimately gives them more decision-making power. Furthermore, working women may have higher exposure to mass media and knowledge of family planning methods and services. In developing societies such as India, the working status of women in agricultural activity hardly changes their status in family and society and, as a result, has little effect on fertility decisions (Ward, 1984). In developing countries, poverty rather than choice often forces women into the labor force (Youssef, 1982). Increased schooling and postponement of marriage affects a woman's choice of marriage partner, son preference, knowledge of contraceptive methods and ability to

control the number of births. Mishra and Retherford (2000), controlling for other factors, found that educated women in India tended to have better nourished children. A better nourished child is one more likely to survive and make additional children seem less important.

A number of researchers have found that a decrease in infant and child mortality has a significant effect in lowering fertility. As the infant and child mortality rates in a society decrease, the parental motivation to replace dead children also decreases (Knodel, 1974). A study by Taylor and Takulia (1971) in India found that the use of contraception is dependent on the respondent's perception of increased child survival. Furthermore, a couple's approval of contraception decreases in proportion to the number of child deaths (Rutstein, 1974). A study by Chaudhury (1996) in India found that the survival status of children, particularly the child mortality rate, emerges as the single most important factor explaining inter-state variations in fertility. Kamal (1999) also found, after controlling for socioeconomic and demographic variables, that the number of children living was one of the two strongest determinants of the use of modern family planning methods.

Some researchers have stressed the education of women and maternal education as the key factors in the decline of fertility in developing countries. As the education level of a soci-

ety increases, fertility rate goes down. Educational attainment of parents, especially of mothers, has been found to have a significant negative relationship with fertility. Maternal education has been shown to be positively correlated with levels of maternal childcare. Literate mothers usually give birth to healthier babies because they have more information about health-care facilities than illiterate mothers. They also have more influence within the family in deciding to take sick children for treatment (Mellington and Cameron 1999; Rajna, Mishra, et.al. 1998; Yadava and Chadney, 1994). According to Caldwell (1982), mass education that tends to emphasize modernization and secular attitudes is the only means to enhance child survival and reduce mortality, as well as fertility. The nature of marital relationship has also been found to be an important factor in family planning. Along with number of children, Kamal (1999) also found the frequency of inter-spousal communication on family planning to be an important determinant of use of contraception.

In developing countries such as India and China, family planning programs play a direct role in reducing fertility. The availability of effective contraception gives contemporary developing countries a major advantage over the European societies that underwent fertility decline earlier. Legalized abortion and other forms of birth control, a trained family planning

workforce, statements by political leaders, public campaigns and the use of mass media in developing countries have accelerated the diffusion of new ideas about family planning in both rural and urban environments, creating conditions for fertility decline (Mauldin and Berelson, 1978). Sunil, Pilai and Pandey (1999) found that family planning programs with peer-based motivational programs were more effective at increasing the likelihood of contraceptive usage than those using cash incentives. However, a study by Robey, Rutstein and Morris (1993) notes that, in contrast to the demographic transition undergone by the now developed world, birth rates in the developing world have fallen even in the absence of improved living conditions. The decrease has also proceeded with remarkable speed. Developing countries appear to have benefited from the growing influence and scope of family-planning programs, new contraceptive technologies and from the educational power of mass media.

The preceding discussion forms the central orientation of this study; that as the level of development in a country increases, the knowledge, attitude and practice of family planning expands, thus bringing a decline in fertility. Therefore, there is a direct relationship between the level of development and cultural acceptance of family planning.

This study will test the following major hypothesis: **The higher the**

**level of development, the more extensive will be the knowledge, attitude and practice of family planning among the states of India.**

### **Data and Measurement**

Data for the study have been obtained from the second National Family Health Survey (NFHS-2) initiated by the Ministry of Health and Family Welfare, Government of India and funded by the United States Agency for International Development. The success of the first NFHS in 1992-93 in creating an important demographic and health database in India paved the way for the subsequent survey. The International Institute for Population Sciences, Mumbai (I.I.P.S.), was designated as the modal agency for providing coordination and technical guidance to the NFHS. Interviews were conducted with a nationally representative sample of 89,119 ever-married women in the age group 15-49 from the 25 states of India. The main objective of the NFHS was to collect reliable and up-to-date information on mortality and morbidity, maternal and reproductive health, fertility and family planning. Data collection was carried out in two phases from November 1998 to March 1999.

The NFHS studies are the most comprehensive surveys of their kind ever conducted in India. (International Institute for Population Sciences, 2000). The two main concepts used in the research are (1) socioeconomic development (measures of the inde-

pendent variable) and (2) knowledge, attitude and practice of family planning (measures of the dependent variable).

The term "socioeconomic development" implies an ongoing process of change in a society and includes a large number of indicators to describe the overall development of a society (Bongaarts, 1978). However, in this study the following 14 variables are selected from the NFHS data of the states of India. These are:

- (1) The percent of household population literate.
- (2) The percent females literate.
- (3) The percent of women age 15-45 completing high school education and above.
- (4) The percent of women age 20-24 yrs married before age 18.
- (5) The percent of women employed.
- (6) The percent urban population.
- (7) The percent exposed to mass media.
- (8) The percent of households with sanitary toilets.
- (9) The percent of households with a drinking water facility from pipe or pump.
- (10) The percent of households with electricity.
- (11) Infant mortality rate.
- (12) Child mortality rate.
- (13) Crude birth rate.
- (14) Total fertility rate.

The data for the independent variables are presented in Table 1. The term "family planning" refers to various aspects of birth control, which are grouped into three major categories.

These are:

- (1) Knowledge: (a) the percent having knowledge of modern contraceptive methods and (b) the percent who have heard a family planning message on the radio or television.
- (2) Attitude: (c) the percent of currently married women satisfied with family planning demand and (d) the percent who discussed family planning with their husband.
- (3) Practice: (e) the percent using contraceptives and (f) the percent sterilized. Table 2 shows data for the dependent variables of family planning (KAP) for the states of India based on the NFHS of 1998-1999. To control for the effects of religious composition, socio-economic status and average family size, each regression model was rerun including these independent variables acquired from India Census, 2001. Five of these variables are percent Hindu, percent Muslim, percent Christian, percent Buddhist and percent Sikh. Average family size was computed as mean number of persons in the state's households.

*Note:* Table 1 Independent Variables: (1) Percent household population literate, (2) Percent female literate, (3) Percent women completing high school education, (4) Percent women age 20-24 married before age 18, (5) Percent women employed, (6) Percent urban population, (7) Percent exposed to mass media, (8) Percent of households with sanitary toilets, (9) Percent of households with electricity, (10) Percent of households with drinking water facility, (11) Infant mortality rate, (12) Child mortality rate, (13) Crude birth rate, and (14) Total fertility rate.

Table 1. Level of Development Variables of the States of India, NFHS Data: 1998-1999

State	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Andhra Pradesh	66.9	36.2	4.0	64.3	58.7	24.9	76.3	27.3	74.4	78.5	65.8	21.0	21.4	2.3
Arunachal Pradesh	73.0	47.3	4.1	27.6	59.6	15.9	63.3	73.9	68.9	80.7	63.1	37.4	22.6	2.5
Assam	74.6	46.1	4.2	40.7	20.2	8.5	52.6	63.2	26.4	60.1	69.5	21.4	21.8	2.3
Bihar	63.2	23.4	2.7	71.0	26.4	10.2	27.3	16.8	18.2	75.4	72.9	34.7	28.1	3.5
Delhi	91.5	70.9	28.7	19.8	20.9	92.1	92.7	94.4	97.7	98.7	46.8	9.0	21.3	2.4
Gujarat	88.7	71.4	16.3	10.1	47.4	41.6	88.4	58.9	93.5	61.8	36.7	10.5	16.6	1.8
Haryana	78.8	44.8	9.2	41.5	12.6	28.8	66.9	39.1	89.1	88.0	56.8	21.2	23.1	2.9
Himachal Pradesh	85.4	63.7	7.6	10.7	20.8	9.1	83.7	27.0	97.2	77.4	34.4	8.3	19.9	2.1
Jammu & Kashmir	68.8	30.2	5.4	22.1	42.4	21.5	74.4	51.0	90.1	70.6	65.0	16.1	23.1	2.7
Karnataka	74.3	44.8	8.5	46.3	52.1	34.8	78.6	38.6	80.9	87.0	51.5	19.3	20.4	2.1
Kerala	92.8	87.4	15.6	17.0	25.0	23.1	88.5	85.2	71.8	19.9	16.3	2.6	18.8	2.0
Madhya Pradesh	72.1	31.5	5.9	64.7	57.2	25.3	54.8	22.2	68.1	63.5	86.1	56.4	26.7	3.3
Maharashtra	82.7	55.4	7.9	47.7	55.7	41.3	70.4	46.0	82.1	81.9	43.7	15.0	23.0	2.5
Manipur	79.7	57.1	14.5	9.9	69.9	33.7	83.8	92.0	75.3	48.9	37.0	19.9	25.8	3.0
Meghalaya	71.7	61.9	4.6	25.5	47.6	20.0	62.7	52.0	41.2	42.1	89.0	36.2	35.7	4.6
Mizoram	93.6	90.0	5.8	11.6	49.9	52.9	83.1	97.7	84.1	63.2	37.0	18.4	25.7	2.9
Nagaland	80.6	60.2	4.7	22.9	63.9	20.3	64.3	74.4	56.3	40.5	42.1	22.7	30.4	3.8
Orrissa	76.0	40.5	3.1	37.6	30.6	11.0	44.3	13.5	33.8	65.3	81.0	25.5	22.1	2.5
Punjab	77.9	61.2	12.7	11.6	9.4	30.8	82.0	51.4	95.5	98.9	57.1	15.9	19.1	2.2
Rajasthan	71.8	24.5	3.5	68.3	43.5	24.2	36.9	28.2	64.4	69.8	80.4	37.6	29.9	3.8
Sikkim	79.3	50.6	5.2	22.3	22.1	14.2	78.5	72.7	80.7	84.6	43.9	28.4	24.5	2.8
Tami Nadu	79.7	52.5	7.6	24.9	53.8	34.6	79.7	34.1	78.8	85.0	48.2	15.9	21.4	2.2
Uttar Pradesh	71.8	29.8	6.9	62.4	23.4	20.0	45.3	26.7	36.6	85.6	86.7	39.2	31.1	4.0
West Bengal	76.0	50.0	5.5	45.9	28.5	23.8	61.4	45.1	36.7	89.3	48.7	19.9	20.8	2.3
<b>Mean</b>	<b>77.9</b>	<b>51.2</b>	<b>8.2</b>	<b>34.7</b>	<b>39.7</b>	<b>28.2</b>	<b>68.2</b>	<b>51.1</b>	<b>69.0</b>	<b>72.0</b>	<b>56.9</b>	<b>23.1</b>	<b>23.9</b>	<b>2.8</b>
<b>Std Variation</b>	<b>7.7</b>	<b>17.5</b>	<b>5.8</b>	<b>20.0</b>	<b>17.6</b>	<b>17.6</b>	<b>17.2</b>	<b>25.0</b>	<b>23.8</b>	<b>19.1</b>	<b>19.1</b>	<b>11.7</b>	<b>4.4</b>	<b>0.7</b>

This variable is highly correlated with crude birth rate (.653) and total fertility rate (.704). Socioeconomic status was computed as a function of the mean measured condition of the household housing structures for each state.

**NOTE:** Table 2 Dependent Variables: (1) Knowledge: (A) the percent having knowledge of modern contraceptive methods, (B) the percent who have heard family planning message on the radio or television; (2) Attitude: (C) the percent of currently married women satisfied with family planning demand, (D) the percent who discussed family planning with husband and (3) Practice the percent using contraceptives, and (F) the percent sterilized

**Table 2. KAP of Family Planning Variables for the States of India, NFHS Data 1998-1999**

	1. Knowledge		2. Attitude		3. Practice	
	A	B	C	D	E	F
State	1	2	3	4	5	6
Andhra Pradesh	98.9	75.9	88.5	10.0	59.6	52.7
Arunachal Pradesh	98.1	67.9	57.2	19.3	35.4	20.6
Assam	98.4	60.8	71.8	20.5	43.3	15.7
Bihar	99.2	39.7	50.0	13.9	24.5	19.2
Delhi	99.7	91.7	82.7	23.6	63.8	26.3
Goa	99.7	85.7	73.5	25.1	47.5	27.8
Gujarat	98.5	62.5	87.4	11.4	59.0	43.0
Haryana	99.9	76.6	89.2	47.4	62.4	38.7
Himachal Pradesh	100.0	88.4	88.8	44.4	67.7	45.1



**Table 2. continued: KAP of Family Planning Variables for the States of India, NFHS Data 1998-1999**

Jammu & Kashmir	98.8	60.6	71.1	22.0	49.1	28.0
Karnataka	99.4	84.4	83.5	14.8	58.3	51.5
Kerala	99.7	80.6	84.4	17.8	63.7	48.5
Madhya Pradesh	97.8	48.9	73.2	16.4	44.3	35.7
Maharashtra	99.4	62.2	82.4	17.5	60.9	48.5
Manipur	95.1	80.8	62.1	18.5	38.7	14.4
Meghalaya	88.4	62.8	36.3	27.4	20.2	6.5
Mizoram	97.8	77.7	78.9	32.6	57.7	45.2
Nagaland	88.0	64.4	50.0	29.8	30.3	12.3
Orrissa	98.6	58.9	75.1	24.4	46.8	33.9
Punjab	100.0	84.8	90.1	49.7	66.7	29.3
Rajasthan	98.8	35.9	69.6	17.7	40.3	30.8
Sikkim	99.4	88.0	70.0	12.4	53.8	22.4
Tami Nadu	99.9	75.7	80.1	13.1	52.1	45.2
Uttar Pradesh	98.4	47.1	52.8	18.5	28.1	14.9
West Bengal	99.6	56.5	85.0	17.8	66.6	32.0
<b>Mean</b>	<b>98.1</b>	<b>68.7</b>	<b>73.3</b>	<b>22.6</b>	<b>49.6</b>	<b>31.5</b>
<b>Std Variation</b>	<b>3.1</b>	<b>15.7</b>	<b>14.6</b>	<b>10.8</b>	<b>14.1</b>	<b>13.6</b>

## Analysis Data and Results

The analysis of data and results presented below are based on two commonly used statistical procedures appropriate for the ratio level variables described above. (a) Pearson's correlation coefficient measures the association between the dependent and independent variables (b) Multiple regression analysis models the KAP variables using the ratio level independent variables of level of development.

### (a) Pearson's Correlation Coefficients:

Table 3 presents the Pearson's correlation coefficients for the level of development and KAP of family planning variables for the states of India. An examination of these coefficients shows that, of the 14 level of development variables, 10 are correlated with all 6 measures of KAP in the predicted direction compliant with the hypothesis. These include percent household population literate, percent women completing high school, percent urban population, percent exposed to mass media, percent of households with electricity, percent of households with a drinking water facility, infant mortality rate, child mortality rate, crude birth rate and total fertility rate.

These results strongly support the major hypothesis that the higher the level of development, the higher the KAP of family planning among the states of India.

**(1) Knowledge:** The first knowledge variable A, percent having knowledge of modern contraceptive methods, is correlated with 10 of the 14 level of development variables in the direction supporting the hypothesis. The strongest correlates are with crude birth rate (-0.705), total fertility rate (-0.680), and percent households with drinking water facility (0.572). The second knowledge variable B, percent who have heard a family planning message on radio or television, is correlated with 13 of the level of development variables in the direction supporting the hypothesis. Eleven of these correlation coefficients are greater than +/- 0.500. These include percent household population literate (0.646), percent females literate (0.689), percent women completing high school education (0.589), percent women age 20-24 married before age 18 (-0.750), percent exposed to mass media (0.914), percent households with sanitary toilets (0.527), percent of households with electricity (0.701), infant mortality rate (-0.709), child mortality rate (-0.688), crude birth rate (-0.593) and total fertility rate (-0.605).

**(2) Attitude:** The first attitude variable C, percent of currently married women satisfied with family planning demand, is correlated in the direction supporting the hypothesis with 12 variables of the level of development. Of these, 4 have Pearson's r coefficients greater than +/- 0.500. They include the percent of households with electricity (0.584),

child mortality rate (-0.553), crude birth rate (-0.781) and total fertility rate (-0.775). The second attitude variable D, percent who discussed family planning with husband, is correlated in the direction supporting the hypothesis with 13 variables of the level of development. However, none of these relationships have Pearson's *r* coefficients higher than +/- 0.500. The strongest correlation with variable D is percent women age 20-24 married before age 18 (-0.465).

**(3) Practice:** The first practice variable E, percent using contraceptives, is correlated in the direction supporting the hypothesis with 13 variables of the level of development, 6 of which have Pearson's *r* values greater than +/- 0.500. These include the percent exposed to mass media (0.607), percent of households with electricity (0.633), infant mortality rate (-0.559), child mortality rate (-0.642), crude birth rate (-0.765) and total fertility rate (-0.763). Of the remaining variables, 2 have Pearson's *r* values greater than +/- 0.400, including percent household population literate (0.500) and percent women completing high school education (0.403).

The second practice variable F, percent sterilized, is correlated with 12 of the independent variables in the direction supporting the hypothesis, two of which have Pearson's *r* values greater than +/- 0.500. These include crude birth rate (-0.565) and total fertility rate (-0.596). Of the remaining

variables, one has a Pearson's *r* value greater than +/- 0.400, percent of households with electricity (0.486).

### **(b) Multiple Regression Analysis**

Finally, in an effort to explore the importance of specific variables of level of development with each individual measure of family planning, six multiple regression analyses were carried out. The results presented in Table 4 include: (1) standardized regression coefficients (Beta); (2) the values of *t*; (3) the values of the *R* square, the overall fitness of the model; (5) the *F* ratio; and (6) the sample size. The six models explaining variance in each of the six measures of family planning were developed with the primary goal of maximizing parsimony and goodness of fit.

Six of the fourteen-predictor variables of level of development (percent women 20-24 married before age 18, percent exposed to mass media, percent households with electricity, percent households with drinking water facility, crude birth rate and total fertility rate), in various combinations, explain at least 21.6%, and as much as 83.6%, of the variance in the six measures of family planning. To control for non-economic factors such as religion, socio-economic status and family size, these variables were added to each model to assess their effects. Table 5 shows the correlation of the control variables with the six dependent variables of family planning.

Table 3. Pearson's Correlation Coefficient between the Level of Development and KAP Family Planning in India

Level of Development	1. Knowledge		2. Attitude		3. Practice	
	A	B	C	D	E	F
1. Percent household population literate	0.113*	0.646*	0.384*	0.328*	0.500*	0.276*
2. Percent female literate	-0.120	0.689*	0.229*	0.351*	0.383*	0.169*
3. Percent women completing high school education	0.213*	0.589*	0.336*	0.148*	0.403*	0.077*
4. Percent women age 20-24 married before age 18	0.145	-0.750*	-0.108*	-0.465*	-0.262*	0.087
5. Percent women employed	-0.441	-0.108	-0.268	-0.453	-0.313	0.062*
6. Percent urban population	0.145*	0.407*	0.334*	0.015*	0.381*	0.229*
7. Percent exposed to mass media	0.126*	0.914*	0.480*	0.230*	0.607*	0.356*
8. Percent of households with sanitary toilets	-0.230	0.527*	-0.056	0.083*	0.106*	-0.218
9. Percent of households with electricity	0.305*	0.701*	0.584*	0.319*	0.633*	0.486*
10. Percent of households with drinking water facility	0.572*	0.100*	0.419*	0.075*	0.397*	0.221*
11. Infant mortality rate	-0.178*	-0.709*	-0.429*	-0.162*	-0.559*	-0.359*
12. Child mortality rate	-0.275*	-0.688*	-0.553*	-0.274*	-0.642*	-0.395*
13. Crude birth rate	-0.705*	-0.593*	-0.781*	-0.117*	-0.765*	-0.565*
14. Total fertility rate	-0.680*	-0.605*	-0.775*	-0.038*	-0.763*	-0.596*

NOTE: (1) **Knowledge**: (A) Percent having knowledge of modern contraceptive methods, (B) Percent who have heard family planning message on radio or television; (2) **Attitude**: (C) Percent of currently married women satisfied with family planning demand, (D) Percent who discussed family planning with husband; and (3) **Practice**: (E) Percent using contraceptives, (F) Percent sterilized. \* Indicates a correlation in the hypothesized direction. **Bold**: Indicates independent variables that correlate in the hypothesized direction with all six of the dependent variables.

Table 4. Multiple Regression Analysis between the Level of Development and KAP of Family Planning in India

Level of Development	1 Knowledge		2 Attitude		3 Practice	
	A	B	C	D	E	F
(4) Percent women 20-24 years old before age 18				Eta - .465 t -2519		
(7) Percent exposed to mass media		Eta .0914 t 10839				
(9) Percent households with electricity			Eta .0284 t 2035		Eta .0354 t 2597	Eta .0286 t 1437
(10) Percent households with drinking water facility	Eta .0423 t 3142					
(13) Qubirth rate						
(14) Total fertility rate		Eta -.570 t -.235	Eta -.603 t -.601		Eta -.588 t -.980	
R Square	0.629	0.836	0.864	0.216	0.660	0.410
F Ratio	18688	117485	21735	6344	23385	7667
N	25	25	25	25	25	25

NOTE: (1) Knowledge: (A) Percent having knowledge of modern contraceptive methods, (B) Percent who have heard family planning message on radio or television; (2) Attitude: (C) Percent of currently married women satisfied with family planning demand, (D) Percent who discussed family planning with husband; and (3) Practice: (E) Percent using contraceptives, (F) Percent sterilized.

As expected, these variables all exhibit weak to moderately strong correlations with the family planning variables.

**(1) Knowledge:** Analysis of regression statistics for the model predicting knowledge variable A, percent having knowledge of modern contraceptive methods, reveals that 62.9 percent of the variance is explained by two of the fourteen measures of level of development. The F ratio for this model is 18.658. Both of the Beta values are in the expected direction supporting the hypothesis. Interpretation of the negative coefficient for total fertility rate suggests that a decrease in fertility among a given state of India promotes norms of smaller family size and motivates families in that state to seek knowledge of modern contraceptive methods. A positive coefficient for percent households with drinking water facility suggests that people living in states of India with more modern infrastructures are more knowledgeable of modern contraceptive methods than those from less developed states. Inserting the control

variables into the analysis explained an additional 19.4% of the variation in knowledge of modern contraceptive methods. Percent Hindu was the strongest predictor among the control variables, with a Beta value of .609 and suggesting that states with higher proportions of Hindus were more knowledgeable of modern contraceptive methods.

The model predicting knowledge variable B, percent who have heard a family planning message on radio or television, is the best fitting and most parsimonious model in the analysis, explaining 83.6 percent of the variance of the dependent variable with only one independent variable, percent households exposed to mass media. The F ratio of 117.485 for this model is, by far, the largest. The regression coefficient for the model suggests that states of India with highly developed mass communication media are able to disseminate very effectively information on family planning to the public. Adding the control variables explained an additional 9.6% of the variation in heard a family planning

Table 5. Correlates of Family Planning with Non-Economic Independent Variables; Census of India, 2001.

	A	B	C	D	E	F
Family Size	0.385	0.504	0.545	0.184	0.543	0.608
SES	0.219	0.466	0.383	0.039	0.383	0.450
% Hindu	0.625	0.140	0.458	-0.266	0.308	0.447
% Muslim	0.176	0.252	0.005	-0.226	0.009	-0.068
% Christian	0.779	0.118	0.481	0.208	0.373	-0.317
% Buddhist	0.152	0.232	0.268	0.572	0.283	-0.030
% Sikh	0.100	0.248	0.086	-0.163	0.041	-0.085

message. The strongest predictors were SES with a Beta of  $-.289$  and percent Muslim with a Beta of  $-.227$ , suggesting that women in states with poorer housing and fewer Muslims were more likely to have heard a family planning message on radio or television. The model predicting knowledge variable B, percent who have heard a family planning message on radio or television, is the best fitting and most parsimonious model in the analysis, explaining 83.6 percent of the variance of the dependent variable with only one independent variable, percent households exposed to mass media. The F ratio of 117.485 for this model is, by far, the largest. The regression coefficient for the model suggests that states of India with highly developed mass communication media are able to disseminate very effectively information on family planning to the public. Adding the control variables explained an additional 9.6% of the variation in heard a family planning message. The strongest predictors were SES with a Beta of  $-.289$  and percent Muslim with a Beta of  $-.227$ , suggesting that women in states with poorer housing and fewer Muslims were more likely to have heard a family planning message on radio or television.

**(2) Attitude:** The model predicting attitude variable C, percent of currently married women satisfied with family planning demand, explains 66.4 percent of the variance in the dependent

variable with two independent variables. The F ratio of 21.735 is the third highest of the six. The strongest predictor is total fertility rate. Percent of households with electricity also contributes to explaining variance in satisfaction with family planning demand. Both Beta statistics are in the direction supporting the hypothesis. These statistics suggest that low birth rates foster norms of lower family size, which in turn increases the demand for family planning. The availability of electricity supports the electronic media needed to promulgate the acceptance and availability of family planning. Adding the control variables explains an additional 17.9% of the variation in satisfaction with family planning demand. The strongest predictors were percent Hindu, with a Beta of 1.353, and percent Christian, with a Beta of 1.043, suggesting that women in states with higher proportions of Hindus and Christians tended to have higher levels of satisfaction with family planning demand.

The model predicting attitude variable D, percent who discuss family planning with husband, explains only 21.6% of the variance with one independent variable, percent of women 20 to 24 married before age 18. Although the model is parsimonious, it exhibits a relatively low F ratio of 6.344. It suggests that marriage of females at a young age reflects a more traditional family structure, so couples exhibiting this characteristic may be less likely to openly discuss family planning,

either because it is assumed that they want a large family or because norms dictate that the decision to utilize family planning is made unilaterally by one spouse. The relatively lower proportion of variance explained by the independent variable suggests that other factors not related to socioeconomic development may significantly influence the propensity of women to discuss family planning with their husbands. Adding the control variables explained an additional 39.8% of the variation in discuss family planning with husband. The strongest predictors were percent Hindu, with a Beta of .634, and percent Buddhist, with a Beta of .561, suggesting that women in states with high proportions of Hindus or Buddhists were more likely to discuss family planning with their husbands.

**(3) Practice:** The analysis of the data for the model predicting practice variable E, percent using contraceptives, exhibits a relatively good fit, explaining 68.0% of the variance in the dependent variable with two independent variables. The F ratio is 23.395. The Betas for both independent variables in the model are in the direction predicted, with use of contraceptives increasing with higher levels of modernization. Total fertility rate is the strongest predictor of percent using contraceptives, suggesting that lower fertility rates promote norms of smaller families and encourage the use of contraceptives among couples in In-

dia. The positive Beta for percent households with electricity indicates higher uses of contraceptives in states of India with more developed infrastructures. Adding the control variables explained an additional 12.7% of the variation in percent using contraceptives. The strongest predictors were percent Hindu, with a Beta of 1.321, and percent Christian, with a Beta of 1.144, suggesting that women in states with higher proportions of Hindus and Christians were more likely to use contraceptives.

The final model predicting practice variable F, percent sterilized, explains 41.0% of the variance with 2 independent variables. The F ratio is 7.657. The stronger predictor of percent sterilized is total fertility rate, as indicated by the higher Beta value (-0.472). This analysis suggests again that low fertility promotes norms of smaller families, making sterilization a more socially acceptable procedure. The positive Beta value for percent households with electricity (0.354) suggests that those from the more modernized or urbanized areas of India are more likely to undergo sterilization. This may be due to social forces in the urban environment encouraging sterilization, for example the reduced value and increased liability of children, or higher levels of availability for the surgical procedure in modern, urbanized areas of India. Adding the control variables explained an additional 23.2% of the variation in percent sterilized. The strongest predictors were percent Hin-



du, with a Beta of 1.233, and percent Christian, with a Beta of .992, suggesting that women in states with higher proportion of Hindus and Christians are more likely to have been sterilized.

Four of the regression models utilized multiple regression with two independent variables. Model A used percent households with a drinking water facility and total fertility rate to explain percent having knowledge of modern contraceptive methods. The correlation between these independent variables is  $-.261$ , a weak relationship that presents few concerns with collinearity. Models C, E and F use percent households with electricity and total fertility rate to explain variation in acceptance and practice of family planning. The correlation between these two independent variables is  $-.466$ , a moderately strong relationship. The high collinearity in these three models makes the Beta weights somewhat less reliable, but does not detract from the models' overall goodness of fit measures.

## Conclusion

The analysis has shown that the considerable variation in knowledge, attitude and practice of family planning among the states of India can be largely explained by each state's level of social and economic development. Of the 84 relationships presented in Table 3, 73 are in the hypothesized direction.

Of the 28 relationships between the two knowledge variables (A and B) and

the 14 independent variables, 23 are correlated in the direction supporting the hypothesis. Levels of development variables are very strongly correlated with the percent who have heard a family planning message on the radio or television.

Of the 28 relationships between the two attitude variables (C and D) and the 14 independent variables, 25 are correlated in the direction supporting the hypothesis. Level of development variables are very strongly correlated with the percent of currently married women satisfied with family planning demand.

Of the 28 relationships between the two practice variables (E and F) and the 14 independent variables, 25 are correlated in the direction supporting the hypothesis. The level of development measures are very strongly correlated with the percent using contraceptives.

Regression analysis shows that various combinations of the level of development indicators significantly predict the KAP of family planning. Knowledge of family planning is best predicted by exposure to the mass media, total fertility rate and availability of a drinking water facility. Attitudes toward family planning are best predicted by total fertility rate, percent of women 20-24 married before age 18 and availability of electricity. Practice of family planning is best predicted by total fertility rate and availability of electricity, though collinearity between the independent variables in these mod-

els makes it difficult to assess which is explaining most of the variation in practice of family planning.

Analysis of the control variables showed that factors other than those indicators of modernization used in the primary analysis, especially religion, are correlated with knowledge, attitude and practice of family planning. It suggests that women in states of India with higher proportions of Hindus and Christians are more likely to know about, accept and practice family planning. Although not as strongly, socioeconomic status as measured by the general condition of the household structures and family size are also valid predictors of family planning.

The results of this study have supported the conclusions of much of the previous research. The study found that attitudes and practice of family planning were positively correlated with exposure to the mass media, confirming the findings of Westoff and Bankole (1999). The percent of women completing high school was positively correlated to all six measures of KAP of family planning, confirming the findings of Chaudhary (1996). Ward's (1984) conclusion that work force participation was not a strong predictor of fertility and Youssef's (1982) conclusion that poverty was a stronger predictor were also confirmed by the study. In that both indicators of practice of family planning were more strongly correlated with SES than percent women employed. Chaudhary's (1996) conclusion that child mortality

rate was the single most important factor in fertility was supported in the NHFS data, in that child mortality was more highly correlated with total fertility than all other variables of economic development, with the exception of exposure to the mass media.

The theme "Population and Development," adopted by the third International World Population Conference held in Cairo, Egypt in 1994 (United Nations 1994) represented a significant change in thinking about population. In addition, the Program of Action covers a wide range of topics that reach into every aspect of human existence, such as infant and maternal mortality, education, status of women, family relationships, poverty, urban development, reproductive health care and family planning. While population policies and programs have long been equated with family planning and fertility control, the Cairo Program of Action addresses the social dynamics involved in formulating these policies by emphasizing population control within the context of socioeconomic development, particularly the socioeconomic development of women. The Program of Action asserts that population growth can be stabilized and development efforts enhanced by the emancipation of women—i.e. by providing women with education, expanding the value of female children, legislating gender equality and promoting equal access to economic and political power. In addition, the Plan of Action emphasizes the promotion and

expansion not only of family planning programs, but also reproductive health programs to bring about a decline in fertility.

The results of this study have several important policy implications for improving the KAP of family planning, and thus reducing the rate of population growth in India. Government policies aimed at increasing the educational levels of women, lowering child and infant mortality, creating basic awareness of population problems through mass media and providing effective family planning services should have a significant impact on reducing population growth.

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