

ANALYSIS OF SEVERAL FACTORS CONTRIBUTING
TO INCREASED FERTILITY RATES IN INDIA:
RELIGION AS COMPARED TO
EDUCATION AND WEALTH

by

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Abstract

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India continues to experience increased population growth, in spite of the country's nationally instituted family planning program that began in 1952. While there is research on the various factors contributing to the continued increase in fertility rates in India, previous studies have utilized older data sets (Chamie, 1981); (Yadava, 1999); (Jeffery & Jeffery, 2000); (Brookins & Brookins, 2012); (Kulkarni & Algarajan, 2005).

One theory about factors influencing fertility rates was explained by Chamie (1981). The theory acknowledges that fertility rates vary based on religion, but the underlying structural differences between religions has a stronger influence on fertility rates than the ideological differences. Chamie (1981) theorizes that socioeconomic factors are different between religious groups and the socioeconomic factors contribute more to differences in fertility than religious differences.

The purpose of this study was to examine the differences in fertility rates between Muslim women and Hindu women in India; as well as the impact that education and wealth, regardless of religion, have on fertility rates in India. It was predicted that Muslim women would have higher fertility rates than Hindu women. It was also predicted

that increased education and wealth would both decrease fertility rates and have a larger impact on fertility rates than religion.

Secondary data was used from the National Family Health Survey- 3 [NFHS-3] which was a survey conducted throughout the 29 states of India between 2005 and 2006. The total number of subjects was N=124,385. Data was analyzed using an ANOVA. It was found that fertility rates of Muslim and Hindu women were significantly different (Muslim $\beta = 0.011$ and Hindu $\beta = -0.309$). It was also found that for every unit increase in education, fertility rates decreased ($\beta = -0.777$ units of children). As wealth increased, fertility rates decreased ($\beta = -0.131$ units of children). It was found that education had a significantly greater influence on fertility rates than that of religion (R^2 change = $-0.811 > -0.304$).

An important implication of this study for the field of social work is the way in which education can be viewed to decrease fertility rates in India and countries facing similar population growth challenges. It is possible that programs aimed at increasing women's education level, to at least that of completing high school, would decrease lifetime fertility rates, and thus increase their self-determination and ability to gain financial resources.

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Chapter 1

Introduction

One of the ethical values of the National Association of Social Worker's [NASW] Code of Ethics (1999) is the value of Dignity and Worth of the Person. The NASW requires that "social workers seek to enhance clients' capacity and opportunity to change and address their own needs;" as well as to "seek to resolve conflict between clients' interests and the broader society's interests in a socially responsible manner". In the context of fertility rates, it becomes important to look at the impact of unplanned pregnancies on women and their children. It is also important to accurately determine the balance of factors that influence a woman's overall family size. In densely populated countries, such as India, these needs are increased due to the limited resources available to support continued population growth.

Globally, one of the biggest obstacles to women's self-determination is the occurrence of unintended pregnancy. An unintended pregnancy occurs when a woman conceives a child when the conception was not in the woman's plan for her life or body at the time of conception. Yet, it is primarily the mother's responsibility to care for the conceived child. Davis (2010) explained that around the world health inequities related to unintentional pregnancies, as well as other reproductive health issues, affect a woman's ability to become educated, financially independent, and free from the social pressures of her society.

The Guttmacher Institute estimates that in 2008 the total number of pregnancies worldwide was 208 million. Unintended pregnancies accounted for 86 million pregnancies, of which 41 million ended in abortion. The unintended pregnancy rate for Asia was higher than the intended pregnancy rate; 78 unintended pregnancies per every 1000 women versus 49 intended pregnancies per every 1000 women.

While Asia had neither the highest or lowest level of unintended pregnancy world-wide, Asia does have the largest proportion of the world population. India is home to one sixth of the total global population (Renjhen, Kumar, Pattanshetty, Sagir & Samarasinghe, 2010). Due to the large population numbers in India, there is a strong need to have an effective national family planning program such as the current program that has been in place there since 1952. According to Renjhen et al. (2010), the largest impediment to India's national development is "uncontrolled population growth" (p. 78).

Although India has maintained the implementation of the highly funded family planning program of 1952 throughout the length and breadth of the country, fertility levels have remained unacceptably high (Kulkami & Alagarajan, M, 2005). It is true that in some states, such as Kerala and Tamil Nadu, fertility rates have fallen in recent years (Kulkami & Alagarajan, M, 2005). However, in the most populous states, such as Uttar Pradesh, fertility rates remain very high (Kulkami & Alagarajan, M, 2005).

Both structural, such as education and socioeconomic status, and ideological factors have been identified as contributing to high fertility rates. Religious ideology about fertility is one of the more identified factors that contribute to fertility rates. Most of the prior studies about the differentials influencing fertility in India have utilized old data sets (Chamie, 1981); (Yadava, 1999); (Jeffery & Jeffery, 2000); (Brookins & Brookins, 2002); (Kulkami & Alagarajan, 2005).

One of the objectives of this study is to examine fertility differentials based on types of religion, while using the most recent national level data available. As suggested earlier, structural factors, most importantly level of education, influence individual fertility levels. A second objective of this study is to assess the net effect of religion on fertility rates of India, in comparison to the effect of structural factors such as the influence of

education on fertility. In sum, this paper attempts to assess the roles that religion, education, and wealth play in determining fertility levels in India.

Chapter 2

Literature Review

In order to understand the impact of unintended pregnancy, it is important to examine the consequences of pregnancy on the health of women and children. Medical technology has advanced since the 1800's and there are more medical interventions available to assist women during child birth. Even with these medical interventions, women still suffer from complications and death as a result of pregnancies. Women that have a planned pregnancy have accepted the risk of pregnancy, while women experiencing unplanned pregnancy are exposed to - risks that were not initially accepted.

The World Health Organization [WHO] (2012) conducted a study that found India had the most maternal deaths in a single country, excluding Sub-Saharan Africa. The WHO (2012) defines maternal death as occurring within 42 days of giving birth, due to complications or morbidities that occurred during the birthing process. The numbers of maternal deaths are particularly alarming when compared to the large number of unintended pregnancies. It is prudent to conclude that a significant proportion of maternal deaths were due to unintended pregnancies.

According to the WHO, there were 287,000 maternal deaths world-wide in 2010 that were a direct result of giving birth (WHO, 2012). Asia accounts for 109,800 maternal deaths with India accounting for 55,000. China, which continues to have similar population control needs as India, accounted for 6,000 maternal deaths. Comparatively there were only 2,200 maternal deaths in developed countries (WHO, 2012). The drastic difference in maternal deaths between developing and developed countries could be due the number of barriers to medical access and cultural beliefs about health seeking behaviors.

One study was aimed at determining incidence and prevalence rates of a variety of conditions that affect women during pregnancy, including mortality. Khalid, Wojdyla, Say, Gulmeoglu & Van Look (2006) examined causes of maternal death through a systematic review of health databases. Hemorrhage was found to be the most frequent cause of maternal death in both Africa and Asia; while in Latin America and the Caribbean, maternal deaths were most often related to “hypertensive disorders”. While HIV/AIDS accounted for 6% of maternal deaths in Africa, 10% of maternal deaths in Asia were related to anemia or obstructed labor and delivery (2006). According to the Center for Reproductive Rights (2008), the most common factors of maternal death in India was found to be anemia, which led to hemorrhage, sepsis, and hypertension. In 2004 Indian 22,000 maternal deaths were directly related to anemia (Center for Reproductive Rights, 2008). Maternal deaths due to hemorrhage, hypertension, sepsis, and anemia could be avoided with increased medical attention before and after child birth (Khalid et al., 2006).

Many of the identified medical conditions resulting in maternal death do not cause immediate death, but impacts the potential for death within the postpartum period for women. According to a study by Ferdous et al. (2012), the postpartum time period for women is the first 42 days post child birth, which is the time period in which most complications from child birth appear. The study attempted to follow women from Matlab, India who had a child between 2007 and 2008. It was found that 42% of the sample had some level of complication within 6- 9 weeks post child birth. Regardless of the number of childbirth complications, almost half of the subjects had some physical consequence of child birth. More than 52% of women gave birth in their own home without the utilization of any medically trained professional (Ferdous et al., 2012).

The study by Ferdous et al. (2012) only examined the impact of complications relating to childbirth on the mother, and did not examine the impact of maternal

complications on the child. When looking at the impact of maternal morbidities it is imperative to recognize the developmental impact on children. Children are impacted by their environments and health of primary caregivers. Research focused in rural Bangladesh examined the effect of maternal morbidities on children's development. The study by Hamadani et al. (2012), found that maternal morbidities did lead to a significant negative effect on children's language and comprehension skills at 12 months. The study was unable to determine the extent to which specific morbidities affected child development due to the large amount of variance in the type of morbidities among the subjects of the study. Structural factors were shown to also have an influence on child development. The factors found to have the largest impact on child development are as follows: psychosocial interaction, nutrition, parents' level of education, socioeconomic status, and level of care given by the mother at 6 weeks old (Hamadani et al., 2012). These factors could be impacted by maternal morbidities, although no correlation between maternal morbidities and child development was determined in the study. It is possible that maternal morbidities could limit a mother's interaction with her newborn child, and thus inadvertently contributing to a negative impact on the child's development (Hamadani et al., 2012).

With the large numbers of possible complications during and after child birth it is important to identify factors that influence health care utilization by new mothers. The results of the Bangladesh Demographic and Health Survey of 2007 found that only about a third of mothers received post-partum care by medical professionals in the "critical period" of 48 hours after child birth (Rashman, Haque & Zahan, 2011). The study showed the following factors influenced the usage of postpartum medical care: "mother's age at delivery, residence, education, antenatal care, place of delivery, wealth, husband's occupation, husband's concern about pregnancy complications and mother's permission

to go to a health care center alone” (Rashman et al., 2011 p. 138). Both economic status and education are the same factors that were found to have an effect on child development. This means that women of low economic status and low education are less likely to seek post-partum medical care, and their children’s development is more likely to be negatively impacted.

Younger mothers are more likely to have lower education and lower socioeconomic status due to having less time to increase both factors. Since these two factors decrease the chances that a mother will seek medical care, it is a possible explanation for a previous study finding that adolescent mothers in India were the least likely demographic to receive medical attention, both during and after a pregnancy (Singh, Rai, Alagarajan & Singh, 2012). The same study found that age of the adolescent mother, as well as the mother’s proximity to an urban environment were predictive of the mother’s utilization of medical care after giving birth (Singh et al., 2012). Adolescents who grew up in rural areas of India, who gave birth between the ages of 15-19 years old, sought medical treatment at lower rates than either their older or more urbanized peers (Singh et al., 2012).

In many places in India adolescent marriage is still practiced. According to Schuler and Rottach (2011), marriage and child birth occurring prior to 18 years old contribute to negative impact on health. In the same study it was demonstrated that perceived social pressure in more rural areas contributed to earlier marriage and child bearing for lower income families in India. Through a qualitative analysis, the study found that often the families worked to encourage delay in child bearing in the young couple; however these attempts yielded mixed results. Desire for a male heir and the fear of infertility were the main reasons that family planning was not utilized in young women (Schuler & Rottach, 2011).

Although the Schuler and Rottach (2011) study is limited due to having a small sample size, the study does bring up an important issue. Does early and frequent childbearing lead to an increased likelihood of unwanted pregnancies or maternal morbidity in the future? According to one study, only 14% of adolescent mothers utilize health services prior to giving birth, 46% utilize medical delivery, and 35% utilize postnatal medical care (Singh et al., 2012). The same study also identified adolescents who marry prior to 18 years old as being at higher risk for frequent pregnancies in the future (Singh et al., 2012). Another study examined the effect of interpersonal skills and age of sexual activity among adolescents in Zambia. The study concluded that although adolescent marriage is declining, the young girls need to be taught intrapersonal and interpersonal social skills in order to delay early pregnancy (Pillai & Barton, 1999).

Due to the higher proportion of unintended pregnancies and large numbers of maternal mortalities in India, it can be inferred that the current family planning program from 1952 may need to be updated to address current population needs. In order to determine what aspects of a program need to be revised, it is important to determine the barriers to the current implementation of the program. In order to determine the barriers to family planning programs, efforts must be made to define what reproductive health encompasses.

The 1994 United Nations International Conference on Population and Development [ICPD] worked to expand the current definition of health to include reproductive health, along with the traditional components of mental and physical health. The ICPD definition of “reproductive health” includes both the ability to reproduce and the “freedom to decide if, when and how often” to reproduce, as well as the right to “be informed and have access to safe, effective, affordable and acceptable methods of family planning of their choice” (as cited in Davies, 2010 p. 388). The ICPD definition includes

both the ability to self-determine family size, as well as the ability to receive information on family size. The definition also implies that through education about family planning, families are more inclined to reduce family size.

The current family planning policy in India does include information about family planning education, but how effective is the current policy, in light of high rates of unintended pregnancies in India? One article examined the longitudinal evolution of the family planning policy in Bangladesh. While much progress has been made in the realms of maternal and infant health, as well as contraceptive awareness; much work is still needed (Jahan, 2007). The article provides multiple recommendations, including increased availability of effective contraception, safe abortion facilities, and education to married adolescents about contraception and gender equality (Jahan, 2007). Based on this report, the current family planning policy is working but there is a great deal of room for increased effectiveness.

If women have the “right” to make decisions about their own fertility, what is hindering women in India from being empowered to make their own decisions about family planning? One point-of-view is that women are making their own decisions to have large families due to the influence of the religious and cultural value placed upon large families.

A book by Chamie (1981) outlines how the Islamic and Catholic religions have similarly strict religious viewpoints about contraception; whereas the Hindu religion and Protestant Christian religions have a more self-deterministic view of contraception. An article by Jeffery and Jeffery (2000), reported previous studies found differences in fertility rates between Hindu and Muslim families. Jeffery and Jeffery (2000) argue that these differences could be more related to intrinsic demographic differences between groups. The article raises the question: do religious authorities have the power and

following needed to ensure all members follows their religious teachings? Does a person's capability to provide basic needs to a child out-weigh the religious value surrounding the contraceptive debate? While religions often have theological directives about contraception, individuals who practice those religions vary in attitudes and usage of contraception

Often in the discussion of contraception, many individuals confuse contraception methods for actual measures to induce abortion. A study by Fagen, Boussios, Moore and Galvin (2006), found that a majority of women surveyed in rural western North Carolina emergency rooms (80%) equated emergency contraception with the abortion pill, RU-486. The study also found that subjects primarily learned about emergency contraception from the media or a friend (Fagen et al., 2006).

According to the American College of Obstetricians and Gynecologists [ACOG], the medical definition of pregnancy is when a fertilized egg implants into the uterus lining (Guttmacher Institute, 2005). The Food and Drug Administration [FDA] reported that emergency contraception works in the following three ways: to prevent the release of a woman's egg from her ovary, prevent male sperm from fertilizing an egg, and prevent a fertilized egg from implanting into the lining of a woman's uterus (Guttmacher Institute, 2005). Emergency contraception does not prevent pregnancy once the fertilized egg implants into the uterus of a woman. The abortion pill, RU-486, does cause termination of a pregnancy after the fertilized egg implants into the uterus (Fagen et al., 2006).

While there are methods of preventing pregnancy and medical methods to abort a pregnancy, it is clear that methods of pregnancy prevention are preferred over methods of abortion. A semi-longitudinal study, by Marston and Cleland (2003), looked at abortion and contraception trends in multiple countries around the globe. The study found that as effective methods of contraception increased, the overall rates of abortion decreased.

This effect was found to be significant in all countries examined in the study (Marston & Cleland, 2003). While most people view abortion practices as negative, these results demonstrate many individuals struggle to make decisions about family planning and want effective measures to limit family size.

In a study of undergraduate students in Ethiopia it was found that students who came from families of lower income had a more positive opinion of emergency contraception than students from higher socioeconomic status (Ahmed, Moussa, Patterson & Asamoah, 2012). Although the sample size of Muslim Ethiopian students was too small to draw definitive conclusions, the study found that four of the six Muslim students in the study had used Emergency Contraception previously (Ahmed et al., 2012). This is a novel finding giving the traditional viewpoint that the Islamic religion has a strict ban against all forms of contraception.

A study conducted examining the contraceptive practices of female Greek medical school students found that only 55% of participants had ever talked with their gynecologist about contraception (Dinas, Hatzipantelis, Mavromatidis, Zepiridis & Tzafettas, 2008). The same study found that 27% of participants believed that oral contraceptives caused cancer. The most reported contraception (45%) used by the medical students' surveyed was condoms (Dinas et al., 2008). This study reflects the ICPD conclusion that more education is needed to help women globally understand the contraceptive methods available and make informed personal decisions.

Pakistan faces similar family planning needs as India due to Pakistan's population being the 6th largest in the world. A recent study investigated the usage and awareness of contraception among low income families at the Woman and Children Hospital in Kohat Pakistan (Masarrat, Gul, Wazir & Javed, 2011). It was found that subjects reported low levels of contraceptive usage, while subjects reported a high level

of contraception awareness. The most reported reason for not utilizing known methods of contraception (69% of subjects) was the desire to have more children. Religious views on contraception were only reported in 10.9% of subjects as a reason not to use contraception (Masarrat et al., 2011).

Data from one Indian study reflected similar results as the Pakistan study. A cross-sectional study by Ghike, Joshi, Bhalerao and Kathalkar (2010), focused on attitudes of women in a rural area of India. In the study it was found that while all subjects had knowledge of contraceptive methods, fewer than 40% of the subjects utilized any form of contraception. The primary reason for non-use was “family pressure” to have a son. One major conclusion of the study is that “Son preference”, a long standing cultural preference to have a male child, should be discouraged (Ghike et al., 2010). The study also found that 70% of respondents gained their knowledge of contraception from “social media” (Ghike et al., 2010). While 56% of the subjects were literate, fewer than 3% of subjects had education above high school level (Ghike et al., 2010). The study did not analyze the impact of education on attitudes about contraception. However, based on the data of this study more research should be done to determine the impact of overall education on family size.

A study conducted at the Government College in Gangtol, Skkim found that 98% of students had knowledge of family planning, and 86% had knowledge of contraception (Renjhen et al., 2010). While 71% of students viewed contraception as beneficial, only 52% of students were willing to use contraception in the future. A total of 78% of respondents did want to use some form of family planning in the future; which include more traditional methods, such as periodic abstinence and *coitus interrupt* (Renjhen et al., 2010). Media was the primary source of information about contraception for 73% of students (Renjhen et al., 2010).

While young adults in various areas of India have knowledge about different forms of contraception, there is a gap between the knowledge and the utilization of contraception. Renjhen et al (2010) found only 23% of subjects viewed contraception as against their religious beliefs. This view is consistent with Chamie (1981) which theorizes that religion may have less of an influence on a person's overall decision about contraception than previously thought.

A study about contraception in Poland done by Mishtal and Dannefer (1991) found that contraception usage in Poland has dramatically increased since the early 1900's. It was found that in 2007 the current contraceptive use was at 56%, as compared to 19% in 1991 (Mishtal & Dannefer, 2010). This increase in usage occurred in spite of the increased religious and political influences "forbidding" the use of any method of contraception. According to Mishtal and Dannefer (2010), in 2002 the church helped create political support that ultimately discontinued contraceptive health insurance coverage.

Ease of accessibility and affordability are often barriers that prevent women from utilizing contraception; however, in spite of increased barriers Polish women are still choosing to utilize contraception in increasing numbers. It was found that 79% of respondents felt that their religious views had "little to no influence" on their decision about contraception, whereas only 36% of respondents felt religion was significantly important to their contraception decision (Mishtal & Dannefer, 2010). Overall age and income level were stronger predictors than education was on contraceptive choice (Mishtal & Dannefer, 2010).

A study conducted in China found similar results to the study in Poland. The study focused on the attitudes and knowledge that Chinese migrant workers had towards contraception. It was found that as women's knowledge increased about contraception,

there was a positive shift in attitudes about contraception (Ip, W. K. Chan, D. S. K. Chan & C. W. H. Chan, 2011). The same study also found a positive correlation between the female subjects' age, education level and work experience with their overall contraceptive knowledge (Ip et al. 2011).

In a study by Pushpa, Venkatech & Shivaswamy (2011), contraception usage was examined in rural areas of India. A systematic random sampling of 430 married women between the ages of 15-49 years old was conducted. Pushpa et al (2011) found that contraception was more accepted as the age of the woman increased. The study also found that 60.78% of Hindu subjects, as compared to 60.30% of Muslim subjects used contraception (Pushpa et al. 2011). This difference is not statistically significant, yet contradicts the belief that religious norms about contraception act as enforcement measures against contraception usage.

Another study aimed at examining the factors contributing to unintended pregnancy in rural Bangladesh found that 30% of births in 2007 were unplanned (Kamal & Islam, 2011). Within the sample, 91% of subjects were Muslim; and 80% of subjects had ever utilized "traditional" contraceptive methods, while 92% had ever utilized modern contraception (Kamal, 2011). These results contradict the traditional view that the Islamic religion influences the individual not to utilize methods of contraception. The same study found that both age and number of children impacted the individual's desire to have subsequent children. Having four or more children, or the older the mother was at the start of pregnancy increased the likelihood the mother reported the pregnancy as unplanned (Kamal & Islam, 2011). It can be inferred that contraception and methods of family planning increase as the desired family size is reached.

Chapter 3

Theory

According to Chamie (1981), there are three types of hypothesizes that are typically used in the study of religion and contraception. These hypothesizes are based on either characteristics, such as demographics; specific religious theology, such as Catholicism or Islam; or “minority group status”. Chamie (1981) expands this theory to explain that the long held view that religious differences contraceptive usage being a result of the differences in religious theology about the acceptability of usage has not held true for Catholicism verses Protestant religions.

Instead Chamie (1981) proposed the “Interaction Hypothesis” in order to explain variance in usage between religions based on two principles. First, the official theology of a particular religion is based on the geographical area being studied. Second, differences in contraception usage are more related to the socioeconomic differences between religious groups. Chamie’s (1981) Interaction Hypothesis illustrates how two religions can vary theologically but still demonstrates similar usage patterns of contraception. Religion I was described as placing high value on large family size and banning contraception. Religion II was described as less directive, leaving matters of family size and contraception to individual determination. When contraception usage was compared, Chamie (1981) demonstrated that both religions had increased levels of fertility when individuals had the lowest socioeconomic status.

Chamie (1981) demonstrated that as individuals in both religions increased socioeconomic status, the overall level of fertility for both religions decreased but at dissimilar rates. Religion I had lower initial declines in fertility, as initial socioeconomic status increased; while Religion II had a more drastic drop in fertility rates. Chamie (1981) attributed the difference to the variance in religious theology about contraception. As

socioeconomic status increased to middle class levels, fertility rates for both Religion I and Religion II declined at similar rates. While the decline occurred at similar rates, there still were significant differences in overall fertility rates, presumably due to theological differences between religions. The similar rates of fertility decline continued until Religion II reached higher levels of socioeconomic status, at which time the fertility rate decline began to level off. At that point Religion I continued to decrease fertility rates until the rates matched those of Religion II (Chamie, 1981).

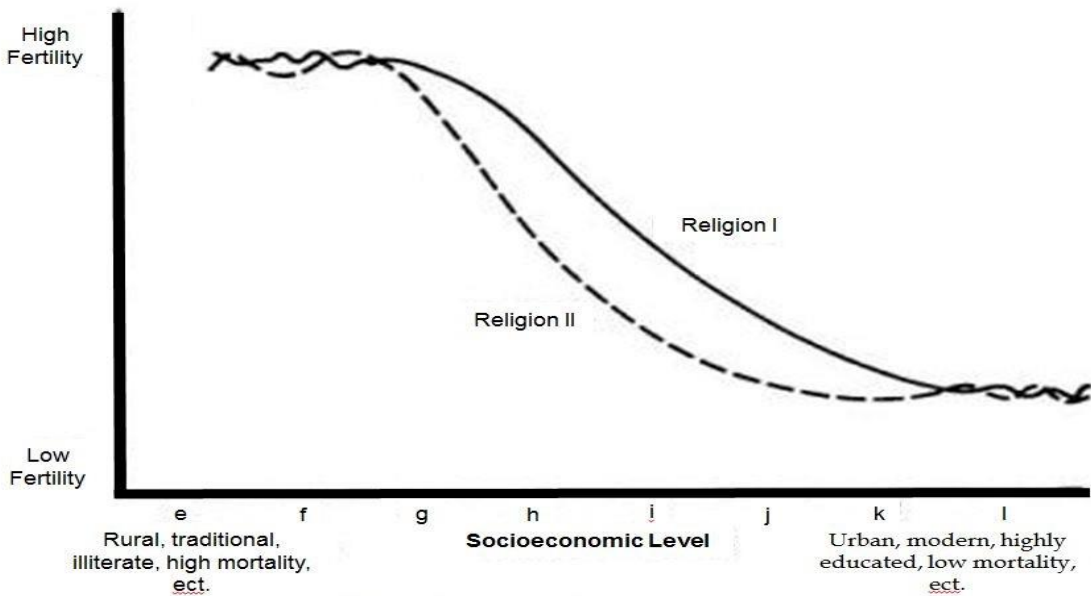


Figure 3-1 Effect of Religion and Socioeconomic factors on Fertility (Chamie, 1981, p 10)

The traditional hypothesis that the theological differences between religions causes the differences in contraception usages does not account for the variance in demographic information between religions. The demographic variance may be directly related to theological viewpoints of religions. Therefore unaccounted demographics are

confounding variables that decrease the internal validity in studies that only focus on religious differences and contraception.

Chapter 4

Hypothesis

Religion serves as an expanded cultural family that influences moral guidelines about political, religious and personal matters. Like a traditional family unit, religious groups have boundaries that have varying degrees of permeability. In western Christianity, Catholicism is traditionally viewed to have more rigid boundaries than their protestant counterparts (Chamie, 1981); (Srikanthan & Reid, 2008); (Jones & Dreweke, 2011). In Eastern religions, Islam is viewed to have more rigid boundaries than the Hindu religion (Chamie, 1981); (Srikanthan & Reid, 2008). Unlike the tight knit structure of a traditional family, religious groups are often too large to enforce their theoretical boundaries. Often religions – rely on “higher power(s)” and individual conscience to be the mystical enforcers of the theological boundaries.

This study seeks to examine if the perceived sanctions in religion truly limit the individual's choice in fertility. Fertility was defined as the total number of children born to a woman. The four hypotheses of this study are as follows:

- 1.) The fertility rates of Muslim women will be different than the fertility rates of Hindu women.
- 2.) Muslim women will have higher rates of fertility than Hindu women.
- 3.) a) As education increases, the overall rates of fertility will decrease; net of all the factors.
b) As wealth increases, the overall rates of fertility will decrease; net of all the factors.
- 4.) a) The influence of education will be greater than the influence of religion on the overall rates of fertility.

b) The influence of wealth will be greater than the influence of religion on the overall rates of fertility.

It was the aim of this study to demonstrate that religious barriers to contraception do not make a difference in the overall fertility rates, as compared to the effects of socioeconomic factors of education level and wealth. For the purpose of this study, the effect of contraception use and region were controlled. Contraception was defined as either ever tried to use some form of family planning, or never tried using a method of family planning. Exact contraceptive methods used were not specifically analyzed for effectiveness. Region was defined as being either urban or rural in demographic nature.

Chapter 5

Methods

5.1 Sample

The data examined in our study was gathered from the National Family Health Survey [NFHS]. The NFHS was a three part survey study conducted by the International Institute of Population Sciences [IIPS] across the 29 states of India that included various health topics and socioeconomic measures. The first survey, NFHS-1 was conducted from 1992-1993. The second survey NFHS-2 was conducted from 1992-1993. The third study, NIHS-3, was the most comprehensive of the studies and was conducted from 2005-2006.

The NIHS-3 is the most recent data set that reflects the largest possible representative sample of India. The NIHS-3 survey collected data from N=124,385 subjects in India. The NFHS-3 included male subjects and unmarried female subjects for the first time. While male subjects were included in the survey, their responses were limited to questions regarding HIV/ AIDS. This study did not utilize male responses and all subjects in this study were females. Calculations were done, by NIHS-3, in order to ensure adequate representation from subjects in both rural and urban areas of India. Stratification was utilized to determine appropriate samples from each of the 29 states within India. Larger states were divided into districts

5.2 Data Collection

The survey was conducted in the field and subjects were interviewed by an NIHS-3 researcher. The researcher used a standardized form with question prompts for uniformity. In cases where the interview was not able to be completed in one visit, the research was able to return to gather the rest of the data.

The NFHS-3 was divided into sections aimed at tracking specific information. The sections are as follows: Marriage and Fertility; Family Planning; Maternal and Child Health; and Women's Empowerment. The Marriage and Fertility section asked questions about age at marriage, family size, age at first birth, etc. The Family Planning section asked questions about currently used methods of contraception, as well as questions aimed at determining the need for family planning. The Maternal and Child Health section asked questions about number of child births, child immunizations, and treatment of childhood diseases, nutrition, anemia, and HIV / AIDS knowledge. Women's Empowerment questions included measures of domestic violence and level of participation in decision-making for the family.

5.3 Operationalization of Variables

The dependent variable being studied is fertility. Fertility, for the purpose of this study, is defined as the total number of children ever born.

Two variables are being controlled for in this study: Contraception Use and Type of Place of Residence. Contraception Use is defined as: Never Used Contraception method (0) and Ever Used Contraception method (1). Contraception method was defined as any method of contraception; including Folkloric Methods, Traditional Methods, and Modern Methods. Type of Place of Residence was defined as urban residences (1) and rural residences (2).

This study aims to explore the effect of three independent variables on fertility: Religion, Education level, and Wealth.

Religion was defined on a nominal scale: Hindu (1), Muslim (2), and Other Religions (3). Other Religions included the various other religions within India, such as Christian, Sikh, Buddhist, and many others. Other Religions were collapsed from the

extensive list in the NHFS-3 dataset because the primary focus of this study was to compare Hindu fertility with that of Muslim fertility.

Education was defined on an ordinal scale: No Education (0), Primary Education (1), Secondary Education (2), and Higher Education (3).

Originally, the NHFS-3 defined wealth using a wealth index that was created by assessing 33 items on a household scale. Items on the list included “consumer items, type of dwelling, source of water, and availability of water” (NHFS-3, 2009 p. 3). The survey divided the scale into five categories: Poorest (1), Poor (2), Middle (3), Rich (4), and Richest (5). However, the distribution of wealth was skewed towards the highest two categories of wealth: Rich and Richest. According to NHFS-3 (2009), this was possibly due to the differences in wealth between urban and rural areas within the study. In an attempt to correct for the skewed data, Wealth was collapsed into two categories: Poor (1) and Rich (2). Poor included the lowest three categories of wealth: Poorest, Poor, and Middle. Rich included the highest two categories of wealth: Rich and Richest.

Chapter 6

Results

6.1 Descriptive Statistics

Fertility rates ranged from 0-16 children. Subjects that had no children accounted for the largest proportion of the sample (32%); and subjects with 9-16 children accounted for only 7% of the total samples. The mean number of children was $x=2.06$, with a median of 2.00 and the standard deviation was 2.046.

It was found that approximately 50.4% of the sample had used contraception at some point; while 49.6% of the sample had never used contraception. Participants located in urban areas of India accounted for 45.8 % of the sample; while rural participants accounted for 54.2% of the sample.

Hindu religion accounted for 72.3% of the total sample. The Hindu religion made up the largest proportion of the sample. Muslim religion accounted for 13.5% of the sample. Other religions accounted for 14.1% of the sample. There were 158 subjects that did not report religion type, however this only accounted for 0.1% of the sample.

Subjects that reported no education accounted for 32% of the sample. Subjects that reported completing primary education accounted for 14.3% of the sample. Subjects having completed secondary education accounted for the largest percentage of the sample, 43.3%, Subjects that completed higher education accounted for the lowest percentage of the sample, 10.4%. There were 12 subjects that did not indicate highest education level; which accounted for less than 0.01% of the overall sample. The mean unit of education was $x=1.32$, with a standard deviation of 1.033. The median unit of education was 2.00.

Subjects, in the combined category of poor, accounted for 44.5% of the sample. Subjects categorized as rich accounted for 55.5% of the sample. The mean unit of wealth was $x = .5545$ and the standard deviation was $.497$. The median for wealth was 1.00 .

6.2 Chi-Squared

A chi-squared test was performed and a relationship was found between contraception use and fertility rates, $X_2(16, N= 124,385) = 54745.969, p < .05$. The association was found significant at the $.05$ level.

A chi-squared test was performed and a relationship was found between type of place of residence and fertility rates, $X_2(16, N= 124,385) = 2189.203, p < .05$. The association was found significant at the $.05$ level.

A chi-squared test was performed and a relationship was found between religion and fertility rates, $X_2(32, N= 124,385) = 1914.036, p < .05$. The association was found significant at the $.05$ level.

A chi-squared test was performed and a relationship was found between highest education level and fertility rates, $X_2(48, N= 124,385) = 28215.543, p < .05$. The association was found significant at the $.05$ level.

A chi-squared test was performed and a relationship was found between wealth and fertility rates, $X_2(16, N= 124,385) = 5981.054, p < .05$. The association was found significant at the $.05$ level.

6.3 Multiple Regression

Table 6-1 Multiple Regression Illustrating the Impact of Variables on Fertility Rates in India

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.477	0.025		97.220	0.000
Contraception Use	1.77	0.009	0.433	190.862	0.000
Type of Place of Residence	0.011	0.011	0.003	1.024	0.306
Highest Education Level	-0.777	0.005	-0.392	148.599	0.000
Hindu	-0.309	0.013	-0.067	-23.060	0.000
Muslim	0.011	0.018	0.002	0.627	0.531
Other (Reference Group)				-	
Wealth	-0.131	0.012	-0.032	-11.190	0.000

The table illustrates the effect of the selected variables on overall fertility rates. It was found that for every unit of increase of education level, fertility decreased by .777 units of children. It is significant at the .05 level. The rich group, as compared to the poor group, had about .131 fewer units of children. It is significant at the .05 level. The difference between Muslim and other religious groups was not significant. Hindu, as compared to all other religious groups, has .309 less units of children. It is significant at the .05 level. The type of place of residence is not significant at the .05 level. People who have ever used contraception have 1.770 more children than people who do not use contraception.

Table 6-2 Multiple Regression Illustrating Variables with Significant Impact on Fertility

Rates

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.477	0.025		97.220	0.000
Contraception Use	1.77	0.009	0.433	190.862	0.000
Highest Education Level	-0.777	0.005	-0.392	148.599	0.000
Hindu	-0.309	0.013	-0.067	-23.060	0.000
Wealth	-0.131	0.012	-0.032	-11.190	0.000

The table highlights the variables that were found to have a significant effect on fertility rates.

6.4 R Squared Change

Table 6-3 Stepwise Regression of Total Children Ever Born on Selected Determinants

Variables	Model 1		Model 2		Model 3		Model 4	
	B	Beta	B	Beta	B	Beta	B	Beta
Contraception	1.882*	.460	1.731*	.009	1.755*	.009	1.77*	.009
Highest Education			-.811*	.004	-.811*	.004	-0.778*	.004
Hindu					-.304*	.010	-0.314*	.010
Wealth							-0.136*	.011
R-Square	.212		.166		.004		.001	

* indicates values that are significant

The Beta coefficient for Highest Education is -.811 and it is significant at the .05 level. Education negatively affected fertility rates. The Beta coefficient for Hindu religion is

-.304 and it is significant at the .05 level. Hindu religion negatively affected fertility rates. The effect of Education was greater than the effect of Hindu on fertility rates, ($-.801 > -.304$). The Beta coefficient for wealth is $-.136$ and it is significant at the .05 level. Wealth negatively affected fertility rates. The effect of Hindu religion was greater than the effect of Wealth on fertility, ($-.304 > -.136$). The R-Squared change table above suggests that variable added at each of the three stages contributed significantly to the total explained variance. Furthermore, the final model explained .001 percentage of the total variance. (.001 is R-square reported for the final mode times 100).

6.5 Hypothesis Restated

The purpose of this study was to determine the effects of religion, education, and wealth on overall fertility rates of Women in India.

First, it was found that fertility rates of Muslim women were significantly different than the fertility rates of Hindu women. (Muslim= .011 and Hindu= $-.309$).

Second, it was found that Muslim women did have significantly higher fertility rates than Hindu women, ($.011 > -.309$).

Third, it was found that that as education level increases, the overall fertility rates would decrease, ($-.777$ units of children per every unit increase in education.). It was also found that as wealth increases, the overall fertility rates would decrease, ($-.131$ units of children per every unit increase of wealth).

Fourth, it was found that education had a significantly greater influence on overall fertility rates than religion, (R squared change: $-.811 > -.304$). It was also found that wealth did not have a significantly greater effect on fertility rates than religion, (R squared change: $-.136 < -.304$).

Chapter 7

Discussion

The primary focus of this study was to explore the influence of specific factors on fertility rates in India. Factors that were examined were religion, education and wealth. This study found that types of religion had varying effects on fertility rates. It was found that Hindu women had significantly lower fertility rates than other religions, including Muslim women. Muslim women were found to have significantly higher fertility rates than Hindu women; but not significantly higher rates when compared to other religions.

One possible reason for this difference in fertility rates is that Muslim and Hindu cultures place different values on socioeconomic factors, such as education and wealth (Jeffery & Jeffery, 2000). According to Jeffery & Jeffery (2000), Muslims tend to have lower wealth and education, when compared to their Hindu counterparts.

This study attempted to determine the degree to which education and wealth impacted fertility rates; in order to address the concern that factors contributing to fertility differences between religions have not been adequately explored. It was found that both education and wealth do have an impact on fertility rates. Education was found to reduce fertility rates the most, followed by religion, and then wealth.

According to the theory by Chamie (1981), fertility rates of both Muslim and Hindu religions were expected to decrease as socioeconomic status increased. While education did fit the theoretical prediction of Chamie's theory (1981), wealth was not as strong of an indicator of fertility as the theory predicted.

One possible explanation for why wealth was not a strong indicator of fertility could be the measure used to categorize wealth. The NFHS-3 utilized a wealth index that was specific to the demographics of India. It is possible that the categorization of wealth

did not adequately measure the concept of wealth presented by Chamie (11981). More research is needed to determine the effect of wealth on fertility rates in India.

This study found that fertility rates decreased after having two children and that contraception usage was an indicator for increased fertility. One possible explanation for contraception being an indicator for increased fertility rates is that the more children a family has, the more likely the family will try to reduce the addition of future children through contraceptive methods. These findings support the Kamal and Islam (2011) study conclusion that as the number of children a family had increased above three, the more likely a family was to report a pregnancy as unintended. This finding suggests that while families do want to have children, there is a limit to the total number of children the family wishes to have. While the number of desired children may vary based on family demographic characteristics, ultimately families do want to control family size.

7.1 Limitations

One possible limitation to this study was the usage of secondary data. While the NHFS-3 is the most recent and inclusive dataset about India's fertility rates, the data was collected from 2005-2006; which was two years prior to the onset of the global recession. It is possible through simple maturation that fertility rates could have changed. It is also possible that some demographics, such as education or wealth, could have changed due to effects of the global recession. While it is possible that demographics could have changed over time, the finding that overall level of education influenced fertility rates more than religion was still an important finding.

Another possible limitation to this study was that this study was not longitudinal in nature. The data was collected one time and no follow up data was collected. It is important to note that women of all ages were included in the study. However, there was

no clear indicator that age was able to be analyzed in this study. One possible explanation for the inability to determine age in this study could be due to cultural differences in how age is reported in India. Continued research should work to see the effect of the variables over time in order to determine any confounding variables not addressed within the scope of this study.

7.2 Implications for Social Work

From the perspective of social work the issue of family planning is rooted deeply within the idea of *self-determination*, as outlined in the NASW Code of Ethics (1999). One of the arguments used to support the importance of programs aimed to reduce fertility rates has been that increases in fertility rates decrease the education level, work opportunities and potential wealth of women (Davies, 2010); (Sonfield, Hasstedt, Kavanaugh, & Anderson, 2013). The article by Sonfield et al. (2013) outlines how the increased availability of contraception since the 1970's has increased women's ability to obtain education, career advancement, and increased financial security. An article by Davies (2010), recommended that there should be increased global efforts to provide all women with accurate education about sexual and reproductive health, and thus reduce fertility levels.

Results of the present study indicate that increasing overall level of education could have a stronger and more pervasive impact on fertility rates. The results of the present study also imply that there is more to the previously determined correlation between fertility rates and education than has been explained through previous research. It is important to note that this study demonstrated that increasing an Indian girl's education from no measurable education to a basic, or primary, education level predicted a decrease in fertility rates. Primary education is often completed prior to the onset of

puberty, therefore is far less likely to be interrupted due to pregnancy. Based on the above mentioned results, assisting women to have a basic level of literacy and mathematical skills could increase her ability to self-determine her family size over a lifetime. More research is needed to understand the impact of this finding on practice.

While this study has focused on the factors influencing fertility rates in India due to the critical need for population regulation; many other countries face similar obstacles in national family planning programs. It is the recommendation of this study that more research continues to determine the effects of religion, education, and wealth on fertility rates of specific countries. In order to understand the needs of specific countries, research must be conducted that reflects and controls for the unique demographics of these countries. In this way, social workers can develop more effective family planning programs that can increase women's ability to determine their desired family size, no matter where a woman might be located geographically.

7.3 Conclusions

The study by Jahan (2007) provided recommendations to improve India's current reproduction program which included: increased availability of contraception and education about family planning methods. However, when comparing the Jahan (2007) recommendations to the findings of this study, two major discrepancies are noticed.

First, approximately half of the subjects had used a method of contraception and contraception use indicated an increase in fertility rates. The fact that so many subjects had used some method of family planning indicates that there is a level of existing knowledge about the importance of contraception. The increase in fertility rates may be explained by individuals using contraception once their desired family size has been

reached. However, more research is needed on the factors contributing to contraception use in India.

Second, it was found that overall education level was the strongest predictor of decreased family size. This means that, while continued education about contraception is important, it may be even more important to develop national programs in India to increase education level, especially in females. One possible explanation for how increased overall education could impact fertility rates is the effect education has on social skills. As discussed by the Pillai and Barton study (1999), increasing adolescent females' intrapersonal and interpersonal social skills could delay early and frequent childbearing. More research is needed to determine how education level impacts the development of social skills and decreases fertility rates.

India is not the only country that could potentially reduce fertility rates through the development of programs aimed at increasing overall level of education. According to the previously mentioned study by Masarrat et al., (2011), Pakistan is faced with similar issues of population growth. The Masarrat et al. (2011) study's findings that contraception awareness was high and contraceptive usage low could be partially explained by the findings of this study that overall education was a large deterrent to fertility rates. More research should be conducted to determine the possible effect that education has on usage of contraceptives versus just contraception awareness.

Appendix A
Figures of Study Demographics

Figure 6-1 Proportion of Total Children Born

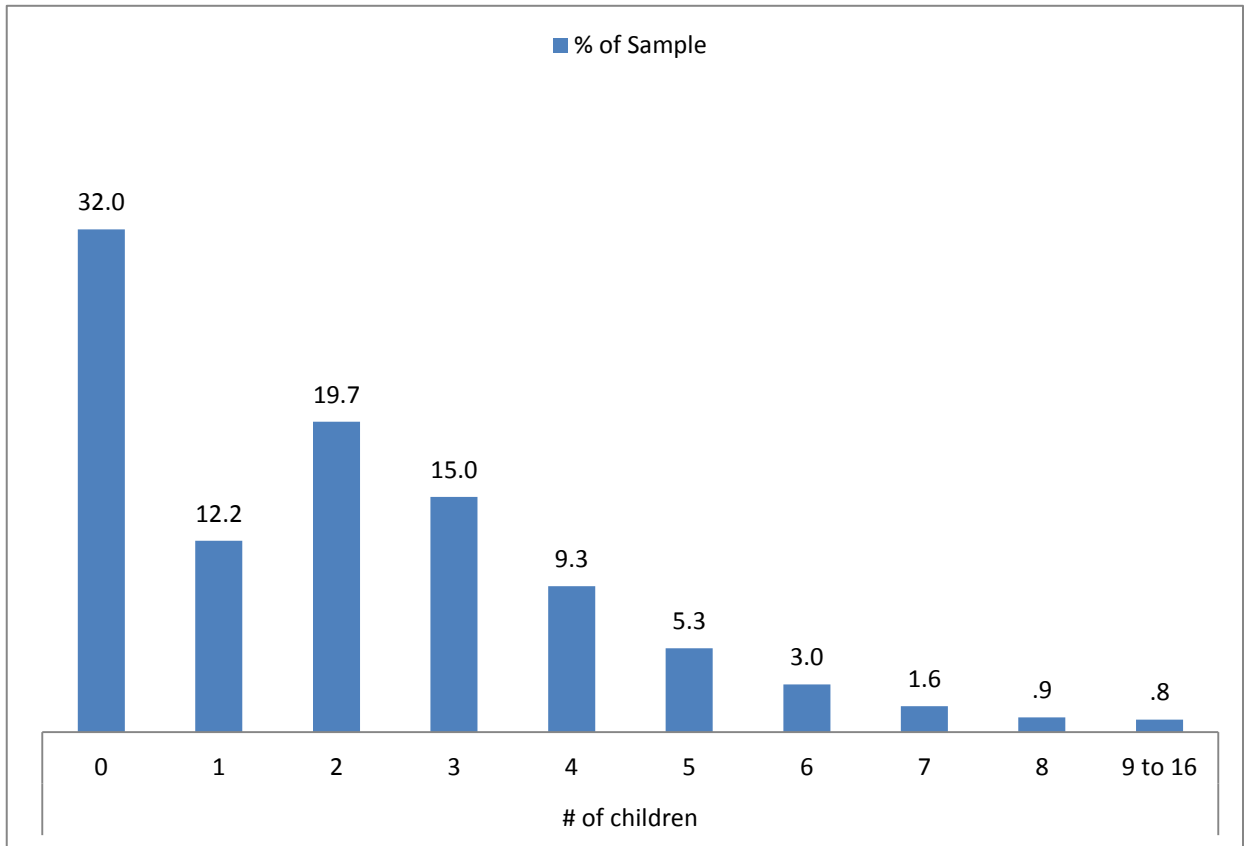


Figure 6-2 Proportion of Contraception Usage

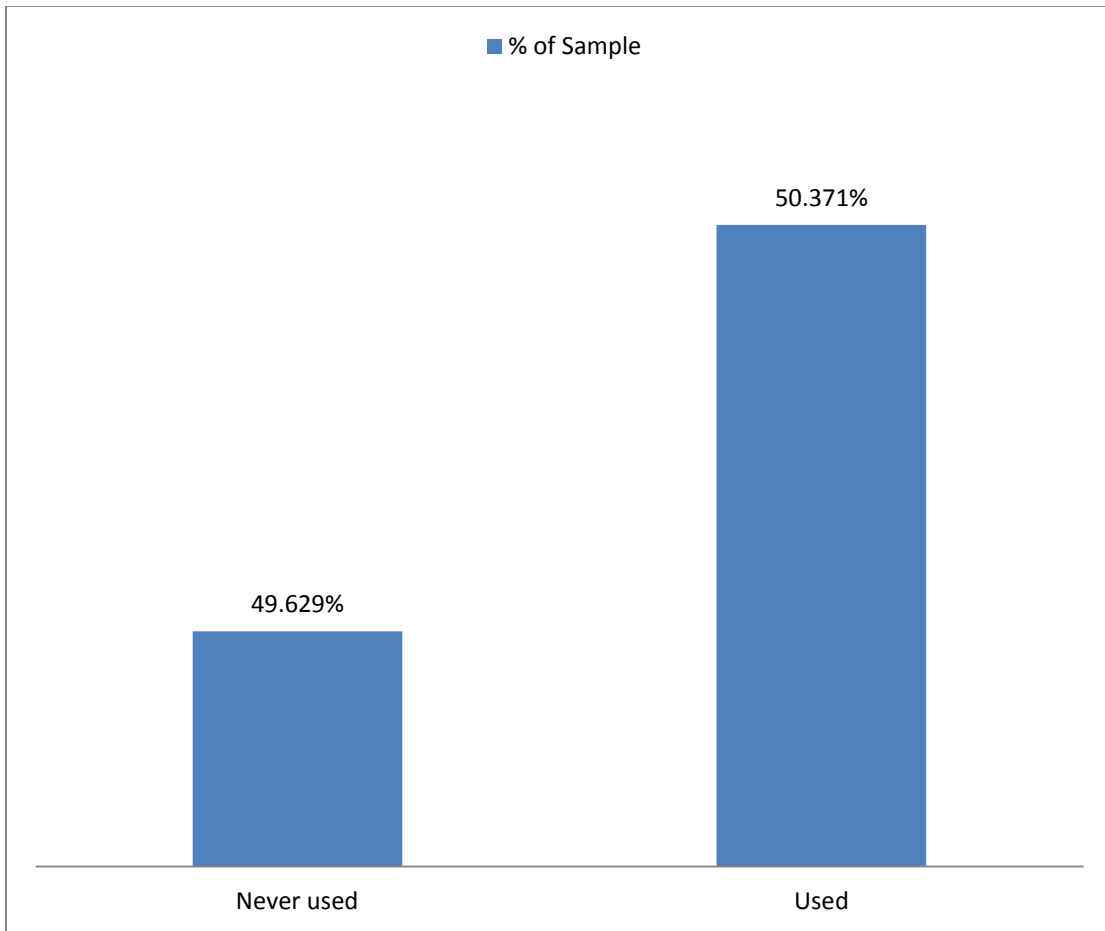


Figure 6-3 Frequency Distribution of Type of Residence

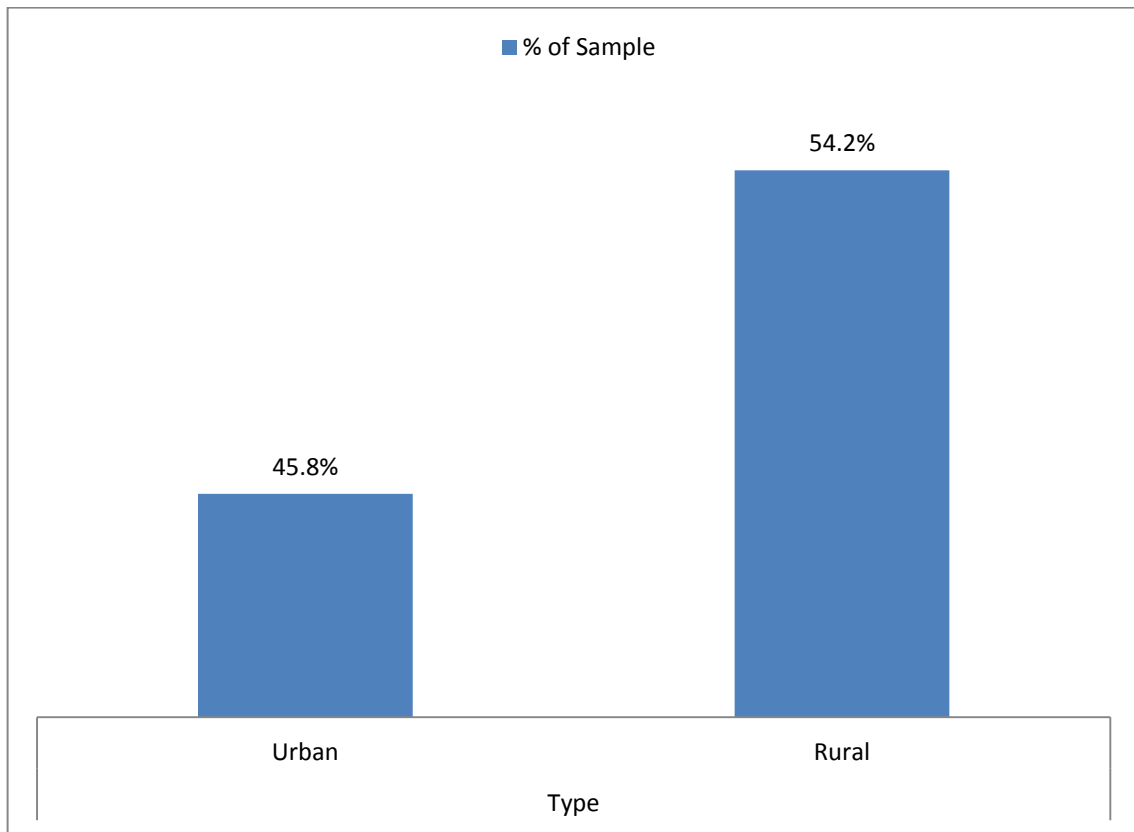


Figure 6-4 Religion Frequency Distribution

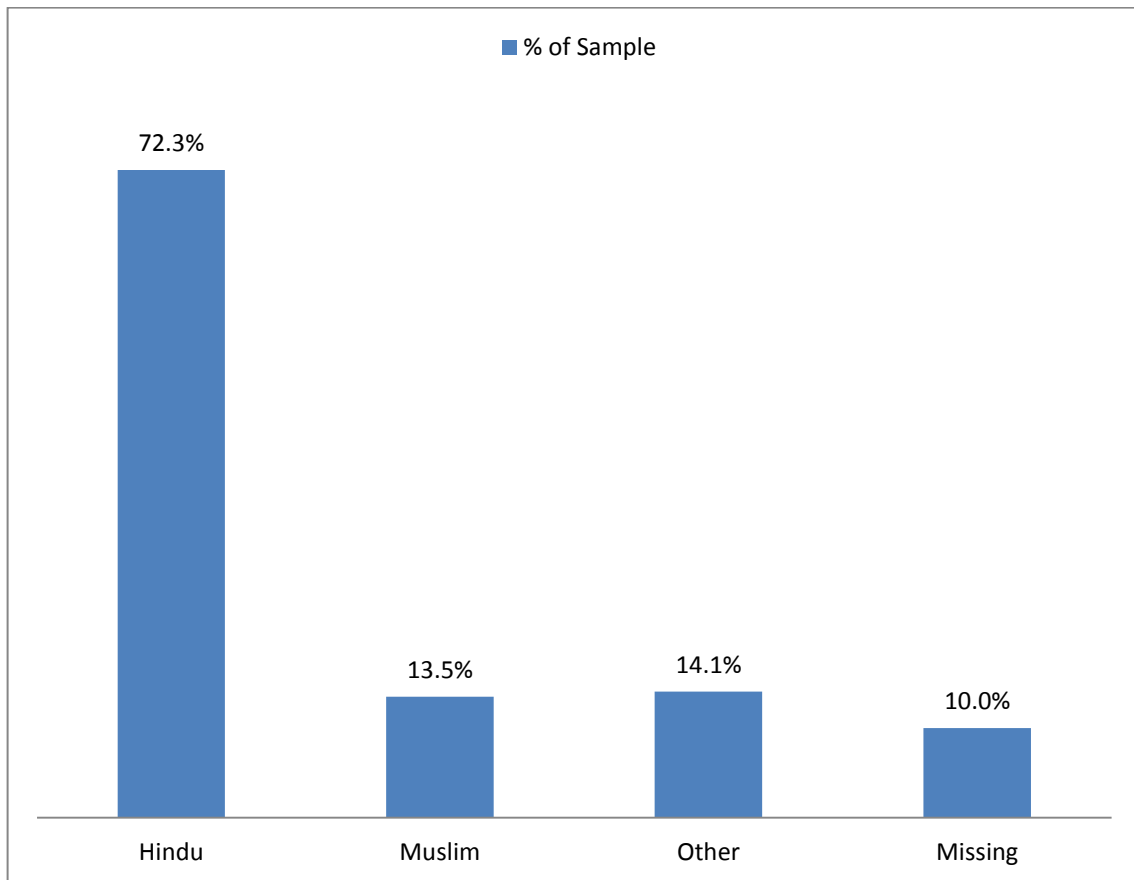


Figure 6-5 Distribution of Highest Education Level

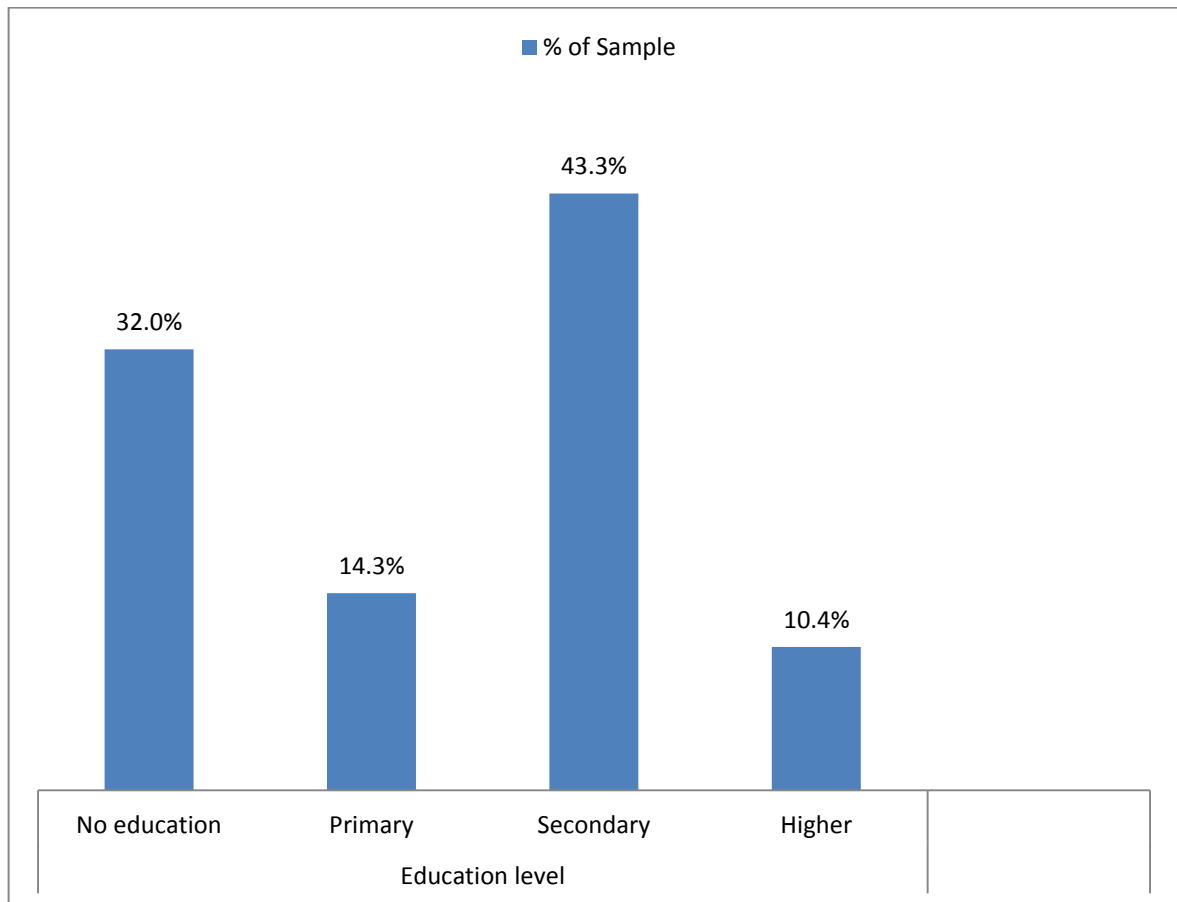
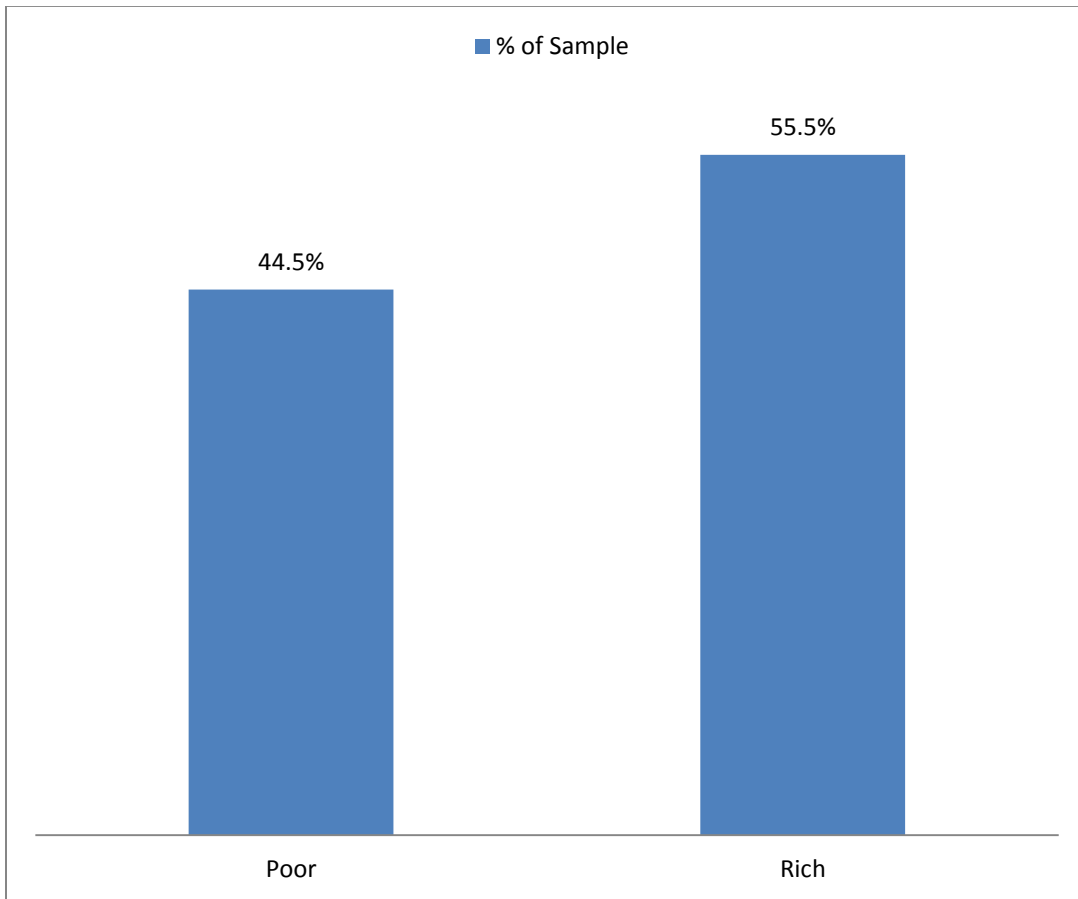


Figure 6-6 Frequency Distribution of Wealth



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