

REPRODUCTIVE HEALTH IN INDIA: AN EMPOWERMENT MODEL

by

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## ABSTRACT

### REPRODUCTIVE HEALTH IN INDIA: AN EMPOWERMENT MODEL

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This study examined the effects of social and economic factors on women's reproductive health in India. Primarily, the study analyzed data from the India Human Development Survey I (IHDS-I 2004-2005). Several statistical methods were used to analyze the data, including descriptive analysis, regression, structural equation modeling (SEM), and multinomial regression. The regression result suggests that social capital, spousal communication, region, autonomy, and accessibility all have significant positive effects on women's reproductive health in India. The SEM suggests that all independent variables have significant effects on women's reproductive health. Multinomial regression offers similar results as regression. Income has no effect on women's reproductive health between women from a low income (-110,000 rupees to 20,000 rupees) and middle income households (30,000 rupees to 50,000 rupees), but women from high-income households (60,000 rupees to 6,520,000 rupees) have significant improvement in reproductive health than low-income women. The study discusses social work implications and limitations as well.

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CHAPTER 1  
INTRODUCTION  
1.1 Background

Women's reproductive health plays an important role in the overall health of a population. Recent studies found that an overall improvement in women's health increases their reproductive health and improves their children's well-being (Pillai & Gupta, 2006). According to the World Health Organization, (WHO, 2002) health can be defined as "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. Reproductive health addresses reproductive processes, functions and systems at all stages of life" and implies that "people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when, and how often to do so" (WHO, 2002).

However, poor reproductive health and inadequate maternal care result in poor birth outcomes (AbouZahr, 1999). Recent studies suggest that in developing countries nearly 500,000 women die each year as a result of pregnancy and childbirth (Bandyopadhyay & MacPherson, 1999). The World Health Organization (2009) also reported that more than 100,000 women die from pregnancy-related problems every year. This high mortality rate may be due to poor health care services. India, for example, has a maternal mortality rate of 500–800 per 10,000 births (Bandyopadhyay & MacPherson, 1999)—one of the highest in the world. Another startling fact is that newborns account for nearly 40% of all under 5 child deaths and among newborn infants in their first 28 days of life worldwide (WHO, 2009). In India and other developing countries, about 10% of infants die before they are 1 year old (Bandyopadhyay & MacPherson, 1999). High maternal and infant mortality rates result in a poor labor force in the

future. Therefore, improving reproductive health has become an increasingly important issue in India.

Studies on reproductive health generally focus on the effects of social, economic, and political factors (Becker, 1996; Berer, 2008; Pillai & Gupta, 2006). These studies characteristically concentrate on two levels of measurement: the population level and the individual level (Becker, 1996; Murthy & Klugman, 2004; Pillai & Wang, 1999). Studies at the population level address human development, social policy, reproductive rights, and equality (Aggleton & Warwick, 2002; Becker, 1996; Pillai & Gupta, 2006). The human development component includes both economic and social factors. These factors are at the aggregate level in terms of their relationship with health (Anand, Peter, & Sen, 2006). A few studies address the relationship between reproductive health and social factors, such as gender inequality and education (Pillai & Gupta, 2006; Wang & Pillai, 2001). These studies suggest that social factors are important to women's reproductive health (Anand et al., 2006; Blanc, 2001; Pillai & Gupta, 2006). Kawachi and Wamala (2007) discuss the relationship between social and economic inequality relative to health. Other studies also suggest that women who have higher social status, income, and education usually have a higher quality of reproductive health (Bandyopadhyay & MacPherson, 1999; Pillai & Wang, 1999).

In 1994, the Cairo International Conference on Population and Development (ICPD) recommended that schools should offer female sexuality and reproduction education to students to help them gain knowledge and increase reproductive health. For example, ICPD suggests that women's reproductive health can be increased through improving their reproductive health choices, health care quality, and contraceptive use (Foley, 2007). Even though reproductive health education is important to women, still only a few countries have put sexual and reproductive issues in the public health arena (Aggleton & Warwick, 2002; Foley, 2007). ICPD also suggested that all countries should try to develop "innovative programs to

make information, counseling and services for reproductive health accessible to all men and women” (Aggleton & Warwick, 2002).

At the individual level, traditional studies focus on conception, gestation, and pregnancy outcomes such as infant and maternal mortality (Pillai & Gupta, 2006; Pillai & Wang, 1999). Social issues related to reproductive health at the individual level include education, relationships, and reproductive health decisions (Bandyopadhyay & MacPherson, 1999; Pillai & Wang, 1999). Economic issues such as personal income and poverty are related to reproductive health (Rani & Lule, 2004). In 1995, The Fourth World Conference on Women in Beijing emphasized the importance of power and resources for women’s reproductive health (Pillai & Wang, 1999). The main theme of the conference included increasing women’s economic and educational status and their reproductive rights (Pillai & Wang, 1999). Women’s reproductive health not only includes conception, pregnancy outcome, and gestation but also the concept of empowerment (Pillai & Wang, 1999). This is particularly important for women’s reproductive health in developing countries.

Recent studies on reproductive health have focused on the effects of social and economic factors (Aggleton & Warwick, 2002; Kawachi, Kennedy, Gupta, & Prothrow-Stith, 1999; Pillai & Gupta, 2006; Pillai & Wang, 1999). However, only a few have attempted to discuss the effect of power and resources on reproductive health. Sen has actually promoted awareness of the social choice concept on health (Anand et al., 2006), suggesting that resources and power issues are central to the discussion of social choice (Sen, 1999). Race, social class, income inequality, and gender could be the reasons for health inequality. Therefore, providing resources to women may improve their reproductive health and increase their ability to make their own reproductive decisions.

Recent studies also examine how both individual and population levels influence reproductive health. Blanc (2001), Cain (2000), and Maternowska (2006) discuss both micro and macro perspectives in improving reproductive health. Within these perspectives, the social

and economic development approach focuses on the role of personal income, relationships, and resources as factors in reproductive health. Blanc (2001) suggests that a power differential in sexual relationships will result in poor reproductive health outcomes. However, social policy, economic development, and high levels of spousal communication will benefit sexual relationship and reproductive health outcomes. In addition, basic human rights, reproductive choices, freedom from violence, and educational opportunities for women also influence women's reproductive health (Cain, 2000; Freedman, & Isaacs, 1993). In sum, both social and economic factors are important for women's reproductive health. In order to understand the effects of both social and economic factors, this study examined the effects of economic as well as social-related variables on women's reproductive health.

### 1.2 Significance of the Study

The studies on reproductive health in the pre-Beijing conference era generally focused on several structural variables. These include social capital and socioeconomic status (Pillai & Wang, 1999). However, after the Beijing conference, several changes occurred in the approach to reproductive health explanations. First, a large proportion of reproductive health studies focused on variables such as reproductive choices and reproductive rights, a change that was borrowed from the Beijing conference, which focused on empowerment as an explanatory variable. Second, increasing social choices to achieve human development and well-being as proposed by Sen (Anand et al., 2006; Sen, 1999) encouraged a choice-based model of reproductive health. However, studies that have attempted to synthesize the effects of socioeconomic as well as choice variables on reproductive health are extremely limited. Furthermore, there are few attempts at assessing the relative importance of choice variables such as autonomy and socioeconomic variables on reproductive health (Cain, 2000; Freedman & Isaacs, 1993). Finally, very few studies examined the relative effects of socioeconomic and choice factors in developing countries. In order to remedy these shortcomings, this study

assessed the effects of a few selected variables, including the effect of individual-level variables, on the reproductive health of women in India.



## CHAPTER 2

### LITERATURE REVIEW

Several recent studies have focused on reproductive health at the micro and macro levels. The main factors related to reproductive health include reproductive rights, family planning, social policy, and education. Other factors, such as economic development and income, also influence women's reproductive health (Cain, 2000; Crane, 2005; Fajans, Simmons & Ghiron, 2006; Danilovich, 2010). Reproductive rights include abortion rights, personal rights, and reproductive decision making (Pillai & Gupta, 2006; Wang & Pillai, 2001). Advances in technology also benefit women's reproductive health, including the choice of abortion methods (Cain, 2000).

Researchers argue that higher income or economic development will result in a higher quality of reproductive health and gender equality (Kawachi et al., 1999; Pillai & Gupta, 2006). This chapter discusses how economic and social factors affect reproductive health in India. The literature for this study was drawn from several databases, including the University of Texas at Arlington electronic library, the Google scholar search, the India Human Development Survey, websites of the World Health Organization (WHO), Demographic and Health Surveys (DHS), the United Nations Development Program (UNDP), and the World Bank. The resources from the University of Texas at Arlington library include Social Science Citation Index, Social Service Abstracts, Social Work Abstracts, Sociological Abstracts, Elsevier, and Health Science. The key words used in the search include the following; social development, economic development, social factors, economic factors, reproductive health, reproductive health in India, and developing countries.

## 2.1 Reproductive Health in India

Women's reproductive health is an important issue in India particularly in light of the country's rapid population growth (Jejeebhoy, 1997). Jejeebhoy (1997) suggests that many Indian women do not have equal access to adequate health care service and economic resources. In addition, they lack the ability to make their own reproductive choices. Over 10% of all maternal deaths, for example, are due to unsafe abortions, according to Jejeebhoy (1997). This is particularly problematic in rural areas where only about 6.6% of trained doctors work. Jejeebhoy (1997) postulates that, ultimately, the quality of health care should be evaluated against several criteria: (a) availability of safe and affordable services; (b) accessibility of information; (c) well-trained service providers; (d) appropriate follow-up care; and (e) regular evaluation of performance. Failure in any of these areas is likely to result in poor reproductive health.

Desai et al. (2010) make extensive use of India's Human Development Survey to discuss social conditions in India. This study suggests that individuals with a higher education are more likely to earn a higher income (Desai et al., 2010) and therefore have greater access to healthcare. Education also promotes better human well-being, including health outcomes and social networks, and contributes to autonomy (Desai et al., 2010). In sum, those with higher incomes and education are more likely to have health information as well as a higher quality of health care service.

## 2.2 Theories on Reproductive Health

Theories of reproductive health are generally grounded in the broader framework of public health as well as in human rights. The relationship is obvious, since in many societies, women are denied their rights because of discriminatory practices embedded in traditional notions of gender and their inferior position in relation to their male counterparts. Datta and Misra (2000) state that even after the ICPD conference, India still lacks policies on women's rights and reproductive health, such as how to empower women or reduce domestic violence.

However, Pillai and Gupta (2006) focus on the relationship among gender equality, reproductive rights, and reproductive health. Blanc (2001), meanwhile, focuses on the relationship between power and reproductive health, arguing that men have more power than women and therefore influence women's ability to access reproductive health services and contraceptives (Blanc, 2001). Other researchers emphasize the importance of economic factors and education on women's rights and accessibility to health services (Crane, 2005; Danilovich, 2010; Pillai & Wang, 1999).

Other theories and frameworks used in addressing reproductive health include Post Abortion Family Planning Service Models (PFPSM) (Curtis, Huber, & Moss-Knight, 2010). The PFPSM model also addresses how family planning and postabortion methods can be used to reduce the risk and number of abortions and lead to an increase in the quality of reproductive health (Curtis et al., 2010). Bearinger, Sieving, Ferguson, & Sharma (2007) also stress the importance of educational programs and economic opportunities as essential factors influencing sexual behavior and reproductive health.

In summary, reproductive health is directly related to reproductive rights, gender equality, women's empowerment, and social and economic situations. Women's empowerment is positively related to reproductive rights and gender equality, and socioeconomic development directly influences women's accessibility to reproductive health programs and services. Theories will be discussed in detail in Chapter 3.

### 2.3 Economic Factors

Economic factors affect reproductive behaviors at both individual and population levels. At the population level, economic development can increase the quality of reproductive facilities and services. At the personal level, higher incomes will provide more resources for women to access health care services. This section discusses the effects of economic development and income on women's reproductive health.

### *2.3.1 Economic Development*

Economic conditions at the level of the individual or community dramatically affects the quality of life. From the availability of technology and energy to the basics, like clean water, the economic circumstances affecting the individual and community make an enormous difference. Shiffman, Stanton, and Salazar (2004) posit political and economic development will help increase women's reproductive health. They suggest that increased economic resources can help increase the safety of motherhood. Cain (2000) focuses on how technology has expanded the limits of reproductive rights, suggesting that when women get more information, they are more likely to make their own decisions. Services like these are only present in relatively thriving economic conditions.

### *2.3.2 Income*

Income is highly related to reproductive health. Women with higher incomes are more likely to have higher levels of reproductive health (Driscoll, Biggs, Brindis, & Yankah, 2001). A higher income increases a women's ability to access reproductive health services and health care, resulting in a higher quality of reproductive outcomes. Driscoll et al. (2001) believe that women with a higher social economic status will live longer, have lower morbidity, and better pregnancy outcomes.

Rani and Lule (2004) examine socioeconomic differences in reproductive health needs and service utilization among young women in 12 developing countries. The result shows that low-income women are more likely to be married by age 18 and to have had at least one child by that age (Rani & Lule, 2004). In addition, low-income women are less likely to use contraceptives or reproductive health services, and are more likely to have a low level of knowledge of HIV intervention (Rani & Lule, 2004). They are also more likely to have unintended pregnancies (Finer & Henshaw, 2006).

## 2.4 Social Factors

Recent studies suggest that social factors are important in women's reproductive health at both individual and population levels. At the population level, social welfare programs and social policy may provide women more chances to access health care services. At the personal level, women's reproductive health can be increased by autonomy and accessibility. Some of the social factors that are discussed in this chapter include reproductive health, reproductive rights, education, and spousal communication.

### *2.4.1 Social Capital*

Social capital is "the social resources, norms, networks, processes, and conditions within society that allow people to develop human and material capital (Mackian, Bedri, & Lovel, 2004: 141)." Miller, Scheffler, Lam, Rosenberg, and Rupp (2006) used a survey of Indonesian family life in 1993 and 1997 to examine the relationship between social capital and health outcome. The result shows that more social capital at the community level will result in a good health outcome.

Ensor and Cooper (2004) suggest that social capital is related to the way people access health care service. People who are low income or belong to vulnerable groups are less likely to access health care services (Ensor & Cooper, 2004). This is due to lack of information, costs of access, and cultural barriers. These barriers will also affect people's ability to identify appropriate health care. Cultural norms will also prevent women from accessing health care services for themselves and for their children, especially when the services are provided by male doctors (Ensor & Cooper, 2004). In addition, a lack of transportation restricts women from obtaining health care.

Social networks also affect women's reproductive health through support, control, and the ability to access resources (Smith & Christakis, 2008). For example, people who have fewer social contacts are more likely to have negative health outcomes such as illness or death. Social networks can help people to connect with resources and therefore result in a higher

quality of both reproductive and overall health (Luke & Harris, 2007; Mackian et al., 2004; Smith & Christakis, 2008).

#### *2.4.2 Reproductive Health*

Reproductive health is defined as women's ability to have a safe and fulfilling sex life, have the capacity to reproduce, and the free will to make their own decisions (WHO, 2002). Beck et al. (2010) conducted a systematic review of published and unpublished data on maternal mortality and morbidity, covering the years 1997 to 2002. Multiple regression models were used to estimate the missing data. The study estimated that in 2005, around 12.9 million births or 9.6% of all births were preterm. Around 11 million or 85% of these were in Africa and Asia; around 0.5 million in Europe and North America (excluding Mexico); and about 0.9 million were in Latin America and the Caribbean. The highest preterm birth rates were in Africa and North America, pointing to a universal reproductive health issue. Preterm birth may cause infant mortality and unhealthy babies. The reduction of preterm births is an urgent reproductive health issue worldwide.

In rural Bangladesh, a study using data on newborn health care (Darmstadt et al., 2010), evaluates a delivery strategy for interventions. The results suggest that risk factors related to infant mortality were neglected at the level of intervention. Health care agencies need to offer skilled care during childbirth. The skilled care includes management of birth, essential newborn care, and infection prevention. All these health care services can help reduce infant mortality and increase reproductive health.

#### *2.4.3 Reproductive Rights*

Correa, McIntyre, Rodrigues, Paiva, and Marks (2005) address the reproductive rights at the population level in Brazil. Correa's study shows social movement in a democracy that influences the sexual and reproductive rights and health policies. Nongovernmental organizations play a crucial role in the national issue, which includes population development; HIV/AIDS; human rights; changes in sexual and reproductive health policies; HIV/AIDS policy

progress; women's health; and services addressing violence against women (Corre et al., 2005).

Danilovich's (2010) surveys in Kazakhstan and Belarus examine the way socioeconomic inequalities in transitional countries affect women's reproductive health services. The result suggests that the education and household income have a significant effect on women's reproductive health in Kazakhstan but not in Belarus. The unreformed health care systems are more accessible in Belarus than in Kazakhstan. This is because the health care system in Kazakhstan is more market oriented.

Pillai and Gupta (2006) used secondary data to analyze the relationship between gender equality and reproductive health and rights. The result suggests that when the level of democracy increases, both gender equality and human rights increase. Furthermore, when human rights increase, women's reproductive health also increases. Therefore, Pillai and Gupta (2006) conclude that reproductive health is positively related to reproductive rights and gender equality.

#### *2.4.4 Education*

There is a high positive correlation between educational levels and women's reproductive health (Saleem & Bobak, 2005). Women who have a higher educational level are more likely to use contraceptives and receive improved maternal care. Women who have less education are more likely to have unintended pregnancies and less likely to receive reproductive health treatment (Finer & Henshaw, 2006). Structured questionnaires were used in southern Malawi to interview women in 20,649 households (Broek et al., 2003). The result shows that educational level was significantly associated with fertility. Women who have a higher level of education are more likely to have successful pregnancy outcomes, because with a higher educational level, women can improve their ability to access health care resources, obtain health information, and reduce domestic violence (Biliter & Schmidt, 2006; Ensor & Cooper, 2004; Panda & Agarwal, 2005).

DeJong et al. (2005) believe that there is a need for sexual education of young people aged 10–24 in the Arab countries. However, sexual programs are rarely taught in those countries. DeJong et al. (2005) suggest that government should develop national health programs for young people. The programs should focus on reproductive health issues and support individual's well-being. In contrast, Thailand has recently introduced universal health care for its people. This health care program includes reproductive health services, hospital care, and sex education (Tangcharoensathien, Tantivess, Teerawattananon, Auamkul, & Jongudoumsuk, 2002). In this program, sex education and reproductive health promotion for adolescents were integrated into general health education. The result shows that after appropriate education, adolescents are more likely to have safe sexual relationships and increase their rate of condom use (Tangcharoensathien et al., 2002).

#### *2.4.5 Spousal Communication*

Spousal communication plays another essential role in reproductive health. Becker (1996) conducted a research on the relationship of couples and reproductive health. Becker (1996) reviewed studies on reproductive health events and outcomes to examine the effectiveness of spouse communication on reproductive health interventions. The result shows that reproductive health interventions result in better outcomes in couples who have more communication than those who do not.

Blanc (2001) believes that the quality of communication between spouses affects contraceptive use. There are three main findings in Blanc's (2001) study. First, when couples agree to stop having children, modern contraceptive methods will be used. Second, men influence women's ability to access reproductive services. However, men's helpful intention and their actual actions are not the same. Men may intend to allow women to access resources or decide on reproductive health decisions; however, the final result is different. Women are prohibited from accessing these services. Third, involving men in spousal discussions often



leads to better reproductive outcomes for women. Therefore, more spousal communication will lead to a higher contraceptive use and ultimately an improved reproductive health outcome.

#### *2.4.6 Autonomy*

Women's autonomy can be defined as physical freedom of movement and their ability to make decisions (Saleem & Bobak, 2005). Saleem and Bobak (2005) used the 2000 Pakistan Reproductive Health and Family Planning Survey to examine the relationship between women's autonomy and reproductive health. This survey included 6,579 ever married women between the ages of 15 and 49. The result shows that women's ability to make their own decisions and their educational level are significantly associated with current contraception use (Saleem & Bobak, 2005).

Blanc (2001) reviewed reproductive health data in 18 developing countries. The result shows that men control more resources and power than women do, resulting in diminished ability on the part of women to gain reproductive health services and make decisions on reproduction (Blanc, 2001). Pillai and Gupta (2006) focus on gender inequality issues and suggest that the lack of the right to make reproductive decisions may result in illegal abortions and reduce reproductive health. Moreover, socioeconomic status and career opportunities also play an important role in young women's reproductive choices (Brewster et al., 1993).

Bloom, Wypij, and Gupta (2001) explored the relationship between women's autonomy and the use of maternal health care in India. The result shows that women with greater autonomy are more likely to obtain higher levels of maternal health care and are more likely to use safe reproductive delivery care (Bloom et al., 2001). Recent studies also suggest that women's autonomy is highly related to their educational level and socioeconomic status (Jejeebhoy & Sather, 2001; Gruskin, Ferguson, & O'Malley, 2007). Higher educational and social economic status will result in higher autonomy. Higher autonomy also results in more contraceptive use and higher levels of reproductive health.

#### *2.4.7 Accessibility*

Accessibility can be defined as the availability of resources and women's ability to access them. Greater accessibility will help women attain a higher quality of reproductive health services. Chase, Maxwell, Knight, and Aggleton (2006) conducted a survey using semi-structured interviews with 63 young people to get data from the youths' perspectives on reproductive health. The questions explored factors relating to health care, social support, and ability to use health care services, which contribute to early pregnancy and parenthood among young people. The result shows that previous experience with reproductive health care services will influence their decision making. In addition, more social support will also help young people to make their own decisions. Another survey by Danilovich (2010) in Kazakhstan and Belarus used logistic regression analyses to determine accessibility and satisfaction with reproductive health services. The study examines how socioeconomic inequalities affect women's accessibility to reproductive health care. The result shows that low-income women are less likely to access health care services due to their inability to afford it. Higher social and economic status will help women increase their ability to access reproductive health services. Therefore, women's reproductive health can be increased as well.

#### *2.4.8 Social Policy and Programs*

At the population level, social policy and programs have a significant effect on reproductive health. Correa et al (2005) suggest that social policy and programs account for both national and local health services. Reproductive health can be improved by increasing women's reproductive health rights, health service programs, and social policies. Shiffman et al. (2004) found that 500,000 to 600,000 women die because of childbirth and pregnancy, making it one of the leading causes of death for women in their reproductive years. Between 1990 and 1997, the death rate was reduced by 40% in Honduras by improved policy making (Shiffman et al., 2004). The governments' policies to decrease women's mortality included developing financial and technical assistance through policies and programs. These programs may include

financial assistance to improve women's ability to access reproductive health services. Through proper reproductive health policy making, women will have a better chance to access a high quality of health care service and to improve reproductive health.

Bearinger et al. (2007) argue that social policy and programs should be offered as early as possible. Country-level reproductive health education programs should be provided to young people at school and should offer accurate and comprehensive sexual information for building adolescent sexual behaviors. Programs should include clinical services, contraceptive methods, youth friendly care, and sex education. These actions will improve the reproductive health of adolescents.

#### *2.4.9 Family Planning*

Family planning is a crucial factor in reproductive health. In the past, fertility and family planning research and programs have focused on women (Becker, 1996). Family planning includes the use of contraceptive methods, abortion, and birth control (becker, 1996; Curtis et al., 2010). After the 1994 International Conference on Population in Cairo, researchers began to focus on family planning in the discussions of reproductive health (Becker, 1996). Becker (1996) believes that through family planning programs, interventions will become more effective and result in improvement in women's reproductive health.

Curtis et al. (2010) suggest that postabortion family planning provides counseling that effectively improves postabortion care and reproductive health. Around 35 million abortions occur in developing countries each year and approximately 20 million of them are unsafe. In developing countries, one in every 75 women dies because of pregnancy or childbirth-related situations. Postabortion family planning offers women services before abortions, significantly decreasing the risk of abortions and increasing reproductive health.

The second trimester abortion happens in women who need abortions after 12 weeks of pregnancy. Berer (2008) focuses on countries where most or at least some second-trimester abortions are allowed. The result shows that many women in developing countries still need

second-trimester abortions and they remain unsafe. Compared with first-trimester abortions, second-trimester abortions have higher risks and need more health care and public health policy support. Therefore, governments should offer more support for women to reduce the risks of abortion and increase their reproductive health.

## CHAPTER 3

### EMPIRICAL FRAMEWORK

The purpose of this study was to examine how social and economic factors affect women's reproductive health in India. Reproductive health is related to the concept of human rights and well-being, accessibility to resources, and ability to make decisions. Three theories were used as a framework for this study: social stratification theory, Amartya Sen's theory, and social capital theory. First, from the social stratification perspective, social and economic development increase human rights (Burt, 1982). It is because with increased accessibility to resources and information, there is likely to be an increase in awareness of human rights. In addition, as human rights increase, people are more likely to make their own decisions, resulting in improvements in women's reproductive health.

Second, Amartya Sen's social choice theory posits that social choice is based on individuals' preferences; people can make their own decisions (Sen, 1977). In Sen's theory, autonomy and accessibility are used to examine their effects on health. Third, social capital theory refers to the social networks and resources (Lin, Cook, & Burt, 2001; Seibert, Kraimer, & Liden, 2001). This study used the above three theories to examine the effects on women's reproductive health. It also measured the effect of selected variables on women's reproductive health. These are income, education, social capital, spousal communication, autonomy, and accessibility.

#### 3.1 Social Stratification Theory

Social stratification theory explains how social positions contribute to an individual's social relations (McGuire, 1950). In social structure, the behaviors of people are generally determined by their social status. Researchers suggest that social positions are created by

culture, history, and the power structure (Kerbo, 2006; Mcguire, 1950; Zanden, 1990). They are also affected by economic development, media, social development, and political movements. Social stratification is defined as an individual's or a group's ranking within a society (Kerbo, 2006). Karl Marx adds the concept of social class to social stratification (Kerbo, 2006). Marx proposes that the life chance of each person will be determined by the social class differential. The chance of an individual enjoying a higher standard of health, services, and opportunities are all influenced by their social status (Zanden, 1990). Max Weber, however, took a multidimensional view of stratification. He looked at several factors including social status, economic ownership, and organizational power (Kerbo, 2006). Each of these dimensions composes a different aspect of social ranking.

From Weber's perspective, the economic dimension of stratification includes wealth and income. "Wealth refers to what people own and income refers to the amount of money people receive" (Zanden, 1990, p. 238). Social status meanwhile refers to the respect and recognition of individuals' prestige (Zanden, 1990). The important factors related to social status are income and occupation (Zanden,1990). Power can be defined as "the ability of populations and groups to translate their preferences into reality and to realize their will in human affairs, even against the will of others" (Zanden, 1990, p. 239). Weber's multidimensional perspective of social stratification allows sociologists to explain more complex social issues. It has now become the most accepted perspective.

Another perspective of social stratification is the functionalist point of view. It suggests that no society is totally classless (Zanden, 1990). All societies need stratification and need to encourage their people to complete the duties related to their status (Zanden,1990). Durkheim, the principal proponent, argues that there are two types of inequalities within societies: external inequality and internal inequality (Durkheim, 1964). External inequalities are forced on individuals by circumstances after birth. Internal inequalities are based on an individual's talent

relative to others (Durkheim, 1964). For the adequate functioning of society, Durkheim (1964) suggests that people should be allowed to move into different positions by their talents.

Social mobility is important to the concept of social stratification. Social mobility refers to the level of movement up or down in a stratified system (Kerbo, 2006). Zanden (1990) suggests that women tend to experience limited chances to move into top positions in the society. This limitation occurs even if they are born into families at the top of the social structure. Social status marks the beginning and the end of mobility. People can move up and down from their current social status (Kerbo, 2006; McGuire, 1950; Zanden, 1990). Combined, these factors are related to people's social mobility. Therefore, higher income and educational status offer people more opportunity to move up to a higher social status.

Pillai and Gupta (2006) suggest that gender equality and reproductive rights are positively related to reproductive health in developing countries. Blanc (2001) discusses how power differentials in sexual relationships determine women's reproductive health outcome. He suggests that social factors related to sexual relationships and reproductive health include the individual, the family, and accessibility to community services. The framework suggests that the power balance in sexual relationships and reproductive health are inversely related.

Danilovich (2010) examined how socioeconomic inequalities influence women's accessibility to reproductive health care. He focused on two countries: Belarus and Kazakhstan. In his study, economic status and education played an important role in accessing reproductive services in Kazakhstan but were less important in Belarus. Maternowska (2006) suggests that economic inequalities also affect women's reproductive health, but Crane (2005) uses a global economic perspective to address sexual and reproductive rights. Based on these studies, it is clear that a person's economic situation can directly influence reproductive health rights, and in the case of women, how they access health care services.

Datta and Misra (2000) suggest that human equality can be developed once people realize their needs. Through empowerment, women can find avenues to increase gender

equality and awareness of their needs. The empowerment theory helps women to obtain their power of decision making. Blanc (2001) suggests that when men control financial resources, women's accessibility to reproductive services suffers. From the empowerment theoretical perspective, women can be empowered to discover their own needs of reproductive health and gender equality.

### *3.1.1 Income*

At the individual level, financial resources are important to women's ability to seek reproductive health services. A higher income offers women a higher quality of reproductive service. In some studies, women with lower incomes have less chance to make reproductive choices (Bearinger et al., 2007; Blanc, 2001; Cook & Kalu, 2008; Crane, 2005; Mathernowska, 2006). Therefore, higher incomes will increase women's reproductive health.

Hypothesis 1: Women's income has a significant positive effect on women's reproductive health. .

### *3.1.1 Education*

Education is another important social factor that affects reproductive health in developing countries. Pillai and Wang (1999) suggest that educated women are more likely to delay their marriage and fertility in favor of a higher quality of life. Women with a higher education may seek personal goals instead of having children. In addition, Bearinger et al. (2007) suggest that sex education is important to youths to increase their sexual knowledge. Girls and boys need equal opportunity to access youth development programs that provide accurate sexual knowledge. That information can also help girls improve their reproductive health. Therefore, higher education will help women improve their reproductive health.

Hypothesis 2: Women's educational level has a significant positive effect on their reproductive health.



### 3.2 Explanations of Autonomy and Accessibility

In the past two decades, social capital theory has become one of the major theories in social science (Adler & Kwon, 2009; Lin, 1999; Portes, 1998). Researchers define social capital as “the features of social organization, such as civic participation, norms of reciprocity, and trust in others that facilitate cooperation for mutual benefit” (Kawachi, Kenndy, Lochner, & Prothrow-Stiith, 1997, p. 1491). Lin defines social capital as “investment of resources with expected returns in the marketplace” (Lin, 2001, p.3). In addition, social capital theory highlights the importance of social networks (Kawachi et al.,1997; Lin et al., 2001). Prior literature links social networks to health outcomes at the individual level (Kawachi et al., 1997). Kawachi et al. (1997) suggest social capital enhances people’s ability to directly access social resources. Baker also defines social capital as “a resource that people get from specific social structures and then pursue their interests and decision making; it is created by changes in the relationship among people” (Baker, 1990, p. 619).”

Recent researchers have applied this concept to a large society. This concept includes relations in and out of the family and public life (Coleman, 1988; Portes, 1998; Tsai & Ghoshal, 1998). Pretty and Ward (2001) identify four central elements of social capital: (a) Relations of trust. Trust reduces the transaction costs between people and resources (Pretty & Ward, 2001). Individuals do not need to invest resources to monitor others and it will save time and money. There are two types of trust: “the trust in the persons we know and the trust in those we do not know” (p. 211). (b) Reciprocity. Reciprocity can help increase trust (Pretty & Ward, 2001). There are two types of reciprocity: specific reciprocity and diffuse reciprocity. Specific reciprocity is defined as “simultaneous exchanges of items of equal value” (p. 211). Diffuse reciprocity refers to a continuing relationship of exchange that at any given time may be unequal in the short term, but balanced in the long term. (c) Common rules. Common rules, norms, and sanctions place population interests above personal interests (Pretty & Ward, 2001). Common rules make people feel comfortable to invest in group activities and know that others will do the same

(Pretty & Ward, 2001). (d) Networks. Social networks and social relationships are important aspects of social capital (Pretty & Ward, 2001). The social capital theory proposes that high social networks and social relationships will produce effective human functioning, high-quality social satisfaction, and economic development (Kawachi, Subramanian, & Kim, 2008; Isham, Kelly, & Ramaswamy, 2002). Researchers also suggest that improvement in social relationships increases access to social resources (Kawachi et al., 2008; Lin et al., 2001). Other studies also indicate the significance of social capital for the individual (Kawachi et al., 2008; Lin, 1999, 2001). The resources inherent in family and the larger society are important to people (Tsai & Ghoshal, 1998).

Holtgrave and Crosby (2003) argue that there is a relationship between social capital and health, explicated as follows: (a) social isolation is related to poor health, (b) health behaviors may be influenced by social capital, (c) social capital may help to develop health services, (d) social capital may improve trust and respect for each other, and (e) social capital may improve democratic political participation (Holtgrave & Crosby, 2003). Social capital theory in general highlights the importance of the quality of social relationships within the community. Researchers suggest that the communities consist of both familial and nonfamilial relationships with improvements in trust, reciprocity, and inclusions in various networks that will be discussed below. Individuals are more likely to feel supported in their family. Furthermore, resources necessary for improving reproductive health may be both private and public. In the case of private resources, accessibility may be restricted because of ownership. In general, public resources have become more accessible with increases in social capital. Informal social networks aim to raise resources and improve access to resources at the time of need. Collective efforts, as well as group pressure, may decrease the costs of accessing resources. In addition to decreased costs, available resources may be shared among family and friends (Astone, Nathanson, Schoen, & Kim, 1999; Fine, 2010; Kawachi et al., 1997; Lin & Erickson, 2008; Westlund, 2006). In general, as social resources increase, accessibility to both private

and public resources also increases. Therefore, as social capital increases, accessibility to resources necessary for reproductive health also increases.

The community's relationships also help to increase autonomous decision making. Within communities people have opportunities to realize their choices. At the same time, people can create and make use of a supportive environment. In general, when community relationship and social capital increase, factors such as trust and social support increase, and social restrictions decrease (external restrictions become less) (Lin & Erickson, 2008; Pretty & Ward, 2001; Westlund, 2006). Therefore, when social capital improves, reciprocity relationships are more likely to improve. When reciprocity relationships improve, women are more likely to be supported in making autonomous relationships. Therefore, as social capital increases, women are more likely to have autonomy in making decisions.

Hypothesis 3: Social capital has a significant positive effect on women's autonomy.

Hypothesis 4: Social capital has a significant positive effect on women's ability to access resources.

### *3.2.1 Spousal Communication*

Decision making and accessibility of resources are important concepts within a family (Hollerbach, 1980). Very few research studies have focused on the effect of power differentials and spousal communication within families on decision making and accessibility of resources (Blanc, 2001; Hollerbach, 1980; O'Neill & Gidengil, 2006). Power in the family can be defined as "the potential or actual ability to influence and change the behavior of other family members" (Hollerbach, 1980, p. 146). Researchers define power as "holding special privileges that are rarely challenged by others" (Emery & Dillon, 1994, p. 375). People with more power are more likely to have more privileges than others. Hollerbach (1980) suggests that power within the family is affected by finances. In addition, power can be measured through the outcome of decision making (who makes the final decision).

Within families, if women have less power, they are less likely to make reproductive choices (Hollerbach, 1980). For example, women's attitude toward pregnancy, contraceptive use, or abortion may be influenced by their husbands. In recent studies, the more spousal communication there was within a family, the more flexible the decision process became (Blanc, 2001; Hollerbach, 1980; O'Neill & Gidengil, 2006). Therefore, through power, women are more likely to make their own decisions. Another approach to the examination of communication between spouses is power processes. Power processes focus on the quality of interaction and communication between spouses, such as general family discussion, decision making, and crisis management (Hollerbach, 1980)..

Hollerbach (1980) suggests that power within a family is usually due to the ability to access resources. These resources may increase people's ability to make decisions and change the behavior of family members. Resources are defined as any "property of a person or group which can be made available to others and are instrumental to the satisfaction of their needs or the attainment of their goals" (Wolfe, 1959, p.100). Within families, men have more ability to access resources than women. McDonald (1980) suggests that resources are strongly related to power. Those who have more power will have more accessibility to resources. However, Blanc (2001) suggests that increasing communication between spouses will result in information exchange, a decrease in men's control, and an increase women's accessibility to resources. Therefore, when spousal communication increases, women's ability to access resources will also increase.

Hypothesis 5: Spousal communication has a significant positive effect on women's autonomy.

Hypothesis 6: Spousal communication has a significant positive effect on women's ability to access resources.

### 3.3 Social Choice Theory

Social choice theory, the pioneering work of Arrow (1951), provides a general approach to social choice and alternative social possibilities (Sen, 1999). Arrow (1951) puts the control of social choice in a structured framework and leads social choice theory to its modern form (Sen, 1999). Early social choice theorists focused on the development of a rational framework and paying proper attention to the preferences and interests of its members (Sen, 1999). Social choice theory can be defined as being "concerned with relationships between individuals' preferences and social choice" (Fishburn, 1973, p. 3). Sen (1983) suggests that when people make social choices they are usually influenced by the individual's preference. Forming a preference among choices usually includes the priority of one's values (Arrow, Sen, Suzumura, 2002; Sugden, 1993). Sen (1983) also proposes that individuals should have the right to choose among alternatives.

Researchers suggest that having rights offers people the ability to make their own decisions (Sen, 1983; Sugden, 1993). People should have the right to make their own decisions or access any information they need. Rights can be defined as "the capacity to make autonomous decisions, to assume responsibilities and to fulfill individuals needs" (Correa, 1997, p. 111). According to this definition, the concept of empowerment is included in reproductive decision making. This enables women to find out their needs on reproductive health. In addition, the capacity set can help people improve their well-being (Alexander, 2008). It presents a person's freedom to make their own choices or accessibility to needed resources.

The social choice theory attempts to transform a set of individual preferences into a social preference (Sen, 1983). Preference can be defined as "the binary relation underlying consistent choice" (Sen, 1997, p. 1). According to Sen's theory, improving the state of affairs of the society, the role of government, social policies, and other planned activities should be toward the improvement of reproductive health. This results in removing barriers that inhibit the mapping of elements in the capacity set to functioning set elements. Poor personal income and

lack of resources will reduce reproductive health. In addition, social conditions, including public health care, public educational arrangements, and the prevalence or absence of crime in the particular location also influence social choices. He suggests further that availability and accessibility to information plays a crucial part in improving the level of social and personal resources (Morris, 2010; Sen, 1984, 1997, 1999).

In general, Sen proposes a framework to examine several aspects of human well-being, including reproductive health. Sen de-emphasizes the role of accumulation of material goods and services in any aspect of human well-being. He identifies two sets of determinants that lead to the enjoyment of reproductive health: First, a set of inputs in the form of material resources and services is needed to accomplish reproductive health goals, and second, sets of social choices that provide a number of perceived alternatives or strategies to acquire and access resources are needed to achieve reproductive health goals. He argues that availability of and accessibility to material goods and services are essential. The capacity to make reproductive health decisions outside of external pressures is an important component of reproductive health. Consequently, Sen highlights the role of autonomy and accessibility in improving reproductive health (Anand et al., 2006; Morris, 2010; Sen, 1984, 1997, 1999).

The key to improving reproductive health is women's autonomy and accessibility. This enables women to make their own reproductive health decisions, based on accessibility of information and resources (Freedman & Isaacs, 1993). Family and community both offer important resources for improving and protecting women's accessibility to resources, leading to increased autonomy for women. Increasing women's accessibility and autonomy is linked to improved health. In addition, reproductive health decision making leads to increased women's reproductive health as well.

Hypothesis 7: Women's autonomy has a significant positive effect on women's reproductive health.

Hypothesis 8: Women's ability to access resources has a significant positive effect on women's reproductive health.

## CHAPTER 4

### METHODOLOGY

The purpose of this study was to examine the social and economic factors that affect women's reproductive health in India. It analyzed data from the India Human Development Survey. Recent studies suggest that income is the most important factor in women's health (Ensor & Cooper, 2004). However, some researchers argue that social factors may be more important than economic factors in the area of human well-being (Anand et.al, 2006). To understand which factor has more effect on women's reproductive health, social and economic factors were analyzed in this study. The variables included income, education, and social capital. Data source and sampling, operationalization of dependent variables and independent variables, and data analysis are discussed in this chapter.

#### 4.1 Data Source and Sampling

The India Human Development Survey I (IHDS-I 2004-2005) data were used in this study. The survey was conducted by researchers from the National Council of Applied Economic Research and the University of Maryland. The goal was to understand daily life in India, such as care for the elderly and children and dealing with health problems. IHDS-I collected data on education, health, social life, daily life, and family interaction in social structures (University of Maryland, 2011). This survey also collected information on social and policy contexts.

The IHDS-I is a national survey of 41,554 urban and rural households from all states and union territories of India with the exception of Andaman, Nicobar, and Lakshadweep. These households are spread across 33 states and union territories, 384 districts, 1,503 villages, and 971 urban blocks located in 276 towns and cities (University of Maryland, 2011).



The study included two questionnaires: the household's and the women's. The household questionnaires were provided to the person who had more knowledge about income and expenditures. This person was usually the male head of the household. The women's questionnaire included health and education questions administered to women who were mostly spouses of the heads of the households. Questions on fertility, marriage, and gender relations in the household were addressed to married women. These women were between the ages of 15 and 49 (University of Maryland, 2011). If no one in the household fit the criteria, that part of the questionnaire was skipped. If more than one woman met the criteria, then one woman was randomly selected to answer the questions (University of Maryland, 2011). When the data were selected from the women between the ages of 15 and 49, a total of 33,481 cases were included in this study. The data for the women and household questionnaires were separated into eight different datasets, including individual, household, medical, nonresident, primary school, birth history, village, and crops. Only the data from the household dataset will be analyzed here.

## 4.2 Operationalization of Dependent Variable

### *4.2.1 Reproductive Health*

Reproductive health variables were found in the women's questionnaire. Variables were recoded as dichotomous with scores 0 and 1. "Desired outcome" was assigned as 1 and the "not desired outcome" was assigned as 0. All variables selected were assigned into three groups: reproductive health capacity (RH Cap), reproductive health knowledge (RH Know), and reproductive health outcome (RH Out). The total values in each part became a new reproductive health score. Lower RH Cap, RH Know, and RH Out scores show a lower reproductive health capacity, knowledge, and outcome.

This study added RH Cap and RH Out to create a new variable. This new variable is RH Well-being. Thus, reproductive health has at least two dimensions, RH Know and RH Well-being (RH Cap + RH Out). It has been suggested that it is necessary to improve knowledge and improve capacity along with current reproductive outcomes. Reproductive health as a bi-

dimensional concept contains capacity variables as well as current reproductive health outcomes. The reproductive health variable has two subdimensions: one was obtained by adding all reproductive health knowledge scores; the second was obtained by adding both reproductive health capacity and outcome variables scores. Even if reproductive well-being (capacity + outcome) is high, the current level of reproductive health may be reduced if reproductive health knowledge levels are low.

Reproductive health capacity variables are current characteristics indicative of potential outcomes that may be either beneficial or harmful, depending on the levels of the characteristics. Consider the variable “age at marriage.” Later ages at marriage are likely to increase the propensity for desirable health outcomes during the course of the reproductive process. For example, women who marry later are more likely to have a healthy newborn when they give birth. In this study, women who have entered into marriage later are assumed to have a high reproductive capacity until they decide to have a child.

Reproductive health outcome variables are current characteristics, which may be either beneficial or harmful depending upon the levels of the characteristics. Consider the variable “number of children.” When the number of children increases, the level of reproductive health is expected to decrease. The variable “reproductive well-being” is a summative measure determined by the contributions of reproductive capacity and reproductive outcome. Thus, the current level of well-being is likely to be high if current positive levels of reproductive outcomes far outweigh negative levels of reproductive health capacity.

Reproductive health is measured by a summative score of both reproductive health knowledge and reproductive well-being. The reproductive health knowledge score is obtained by adding the score on a number of health knowledge variables such as “drinking milk every day during pregnancy,” “first thin milk is good or harmful for the baby,” “is smoke from wood burning good or harmful for health,” “water drink when children have diarrhea,” and “ever heard of AIDS.” See Appendix B Table B.1.

In this study, reproductive health was measured at three different levels. This was done to ensure that the results of this study would remain consistent across three different measurements: nominal, continuous without measurement error, and continuous with measurement error. The first is a composite score obtained by adding the responses to 13 different questions on reproductive health. These 13 questions indicated three subdimensions: reproductive capacity, reproductive outcome, and reproductive knowledge. Reproductive capacity was measured by using five questions, reproductive outcome by three, and finally reproductive knowledge by five questions. See Appendix B Figure B.1.

A second measure conceptualized reproductive health as a latent construct indicated by three variables: reproductive capacity, reproductive outcome, and reproductive knowledge. Each of the three variables was obtained as a composite of the questions associated with the respective subdimension as indicated above. In this measure, each of the measures of the three variables is expected to contain measurement error. See Appendix B Figure B.2.

A final measure of reproductive health identified four categories. The categories were constructed as follows: If the composite score on reproductive capacity was 2 or lower, it was coded 0, otherwise 1. If the composite score on reproductive outcome was 2 or below, it was coded 0, otherwise 1. Finally, if the composite score on reproductive knowledge was 2 or below, it was coded 0, otherwise 1.

The approach used in making decisions with respect to the cutoff points (0 or otherwise) for less or high was, although theoretically justifiable, somewhat arbitrary. Methods such as correspondence analysis were used to determine if the cutoff points implemented in this study are empirically justifiable. The purpose of correspondence analysis is to obtain sets of numerical values for the categories of the variables. This method also shows the associations between the variables (Greenacre, 2005).

The categorical values assigned to each of the three subdimensions were added. All those who scored 0 on all three subdimensions were assigned to a new category 0. All those

who scored 1 on any one of the three subdimensions was assigned to a new category 1. All those who scored 1 on any two of the composite scores were assigned a new category 2. Finally, all those who scored 1 on all three subdimensions were assigned to a new category 3. This assignment produced four ordinal categories. The reference category was all those who were assigned a score of 0. See Appendix B Figure B.3.

#### 4.3 Operationalization of Control Variable

##### *4.3.1 Region*

Region in the India Human Development Survey is the place where participants live, divided into three categories: rural, urban, and slum. In this study, rural and slum area were recoded as 0 and urban was recoded as 1. See Appendix B Table B.2.

#### 4.4 Operationalization of Independent Variable

##### *4.4.1 Income*

The India Human Development Survey collected detailed income data from eight different types of sources. These sources were listed on the household questionnaire. They were farm income, salary income, agricultural wages, nonagricultural wages, remittances, nonfarm business income, public benefits, and other income. Farm income included crop production and residues, animal ownership, and expenses for a variety of farm inputs (Desai, Dubey, Joshi, Sen, Sharif, & Vanneman, 2008). Wage and salary incomes were the total money of all jobs in the household. Remittances were total money sent from other family members. Nonfarm business income was net business income; public benefits included benefits from government and nongovernmental organizations (See Appendix B Table B.3). The total household's annual income range in this data was from -108,327.8 rupees to 6,520,261 rupees. (The negative income suggests that some Indian households are in debt.) In order to deal with the huge range, income was divided by 10,000 and then that number rounded.

#### *4.4.2 Education*

The India Human development Survey collected useful educational data from the household's and women's questionnaires. The data included the highest adult education level and the education level completed for the eligible women. Adult is defined as individuals 21 years or older (Desai et al., 2008). Eligible women are defined as married and between 15 and 49 years old in the household (University of Maryland, 2011). The range for the variable "years of education completed" is 0 to 15. See Appendix B Table B.4.

#### *4.4.3 Social Capital*

Different types of social capital data were collected by the India Human Development Survey. Three major areas were found in this household questionnaire. They were social network, membership in organizations, and confidence in institutions. All variables belonging to the three major areas were selected. The variables that were missing information on more than 30% of data were excluded. Desired outcome was recoded as 1 and undesired outcome was recoded as 0. In social network and membership in organizations, those who said "no" were coded as 0 and those who said "yes" were coded as 1. In "confidence in institutions," those who said "hardly any confidence at all in them" were recoded as 0. Those who responded "with only some confidence" were marked at 0.5, and those "with a great deal of confidence" were 1. All scores were added together to yield a social capital score (SocCapitalS). Higher social capital scores indicate higher levels of social capital in the household. See Appendix B Table B.5.

#### *4.4.4 Spousal Communication*

Variables related to spousal communication were found in the women's questionnaire, which included questions about work, farming, money, and the community. Those who responded to the question with "never" were coded as 0. Those who said "sometimes" were coded as 0.5, and those who said "often" were coded as 1. Scores from each variable were totaled to obtain the spousal communication score (SpousalS). A higher score suggests better communication between spouses in the household. See Appendix B Table B.6.

#### *4.4.5 Autonomy*

Variables related to autonomy were selected from the women's questionnaire. Again, variables with missing data of more than 30% were excluded. Thirteen variables were selected in this paper. Variables related to "who has the most to say," those who "with little or nothing to say" were coded as 0 and those who "has most to say" were coded as 1. A variable called "girls' harassment," "How frequently are unmarried girls harassed in your village/neighborhood" was recoded often as 0, sometimes as 0.5, and rarely as 1. For a variable, "who chose your husband," those who said "parents or other relatives alone" and "others" were recoded as 0. Those who said respondent and parents/other relatives together were recoded as 0.5. Finally, those who said herself were recoded as 1. All scores were totaled for the autonomy score (AutoS). A higher score indicates that women have more autonomy in the household. See Appendix B Table B.7.

#### *4.4.6 Accessibility*

Variables related to accessibility were found in the household's and women's questionnaires. Questions with more than 30% data missing were excluded. Five variables were selected. Only the question, "does anybody in the household have health insurance" was found in the household questionnaire. The other variables were in the women's questionnaire. In order to get a positive direction from each variable, all questions were recoded in the positive direction. All scores were totaled to produce an accessibility score (AccessS). A higher score indicates more accessibility in the household. See Appendix B Table B.8.

### 4.5 Data Analysis

Data analysis was done in several steps. In the first step, all the variables selected for the study were described in terms of measures of central tendency and dispersion. Proportions were presented when the variables involved were dichotomous or categorical. The second step involved crafting adequate measures for all the dimensions in this study. The five latent variables in the study were autonomy, accessibility, social capital, spousal communication, and

reproductive health. In the preceding section on measurement, all the variables associated with each of the five latent variables were described.

In the last step, composite scores were derived for each of the five latent constructs in this study. The composite scores were obtained by adding the values of each of the indicators of the construct. The final measurement model had one control variable and six independent variables with reproductive health as the outcome variable. The final proposed model was evaluated using three different statistical methods. When reproductive health was measured as a unidimensional composite core, path analysis was used. When reproductive health was evaluated as a construct, structural equation modeling (SEM) was used to test the hypotheses presented in this study. Finally, multinomial logistic regression was used to evaluate the hypotheses when reproductive health was measured at the nominal level.

In order to evaluate hypotheses by using multinomial regression, a researcher needs to measure the variables of the nominal level. Each variable that had more than three categories was recoded into three categories. Cumulative percentage was used to divide the categories. The first category contained from 0% to 33% of the participants, the second category had 34% to 66% of the participants, and the third category included 67% to 100% of the participants.

Annual household incomes ranging from -110,000 rupees to 20,000 rupees were recoded as 1 (low income), ranging from 30,000 rupees to 50,000 rupees was recoded as 2 (middle income), and ranging from 60,000 rupees to 6,520,000 rupees was recoded as 3 (high income). The low-income families became a reference group. Women's education years at 0 year was coded as 1 (no education), education years ranging from 1 to 7 years was coded as 2 (middle level of education), and education years ranging from 8 to 15 years was coded as 3 (high level of education). The no education women became a reference group. Autonomy scores ranging from 0 to 7 were coded as 1 (low level of autonomy), ranging from 7.01 to 9 were coded as 2 (middle level of autonomy), and ranging from 9.01 to 13 were coded as 3 (high level of autonomy). The low level of autonomy women became a reference group. Accessibility

scores ranging from 0.5 to 2.75 were coded as 1 (low level of accessibility), ranging from 2.76 to 3.25 were coded as 2 (middle level of accessibility), and ranging from 3.26 to 5 were coded as 3 (high level of accessibility). See Appendix B Table B.9. The low level of accessibility women became a reference group. For reproductive health categories, category 0 women were named as low level of reproductive health, category 1 were named as middle low level of reproductive health, category 2 were named as middle level of reproductive health, and category 3 were named as high level of reproductive health. The low level of reproductive health women became a reference group. Lastly, compared with women who lived in urban areas, women who lived in rural areas became a reference group.

#### 4.6 Handling the Missing Data

Many methods can be used to handle missing data. Inbar (1977) suggests that people in the same age group share the same values. People who grow up in the same age generation will be influenced by the same culture; therefore, the same-age people are more likely to have the same values. This study examined the effects of social and economic factors on women's reproductive health in India. The same-age Indian women tend to share the same values such as autonomy, accessibility, and reproductive health information. Following the reasoning above, this study imputed mean values of the variable with missing data grouped by age of the respondents.

First, this study used the descriptive analysis method to get missing data frequencies for each variable. Second, the mean value of the variable for each age group was obtained. Third, the missing value of each age group was found by using cross-tabulation. Finally, the author imputed the mean of the variable of each age for missing values. Then the new data set was created as mean imputed data.



## CHAPTER 5

### RESULTS

This study used several statistical methods to measure the effects of social capital, spousal communication, education, income, region, autonomy, and accessibility on reproductive health in India. It includes descriptive analysis, regression analysis, confirmatory factor analysis, structural equation modeling, and multinomial regression. This chapter presents the result of these analyses.

#### 5.1 Descriptive Analysis

##### *5.1.1 Reproductive Health*

Reproductive health includes three subdimensions: reproductive health capacity, reproductive health knowledge, and reproductive health outcome. There are 33,481 cases in total. Five variables are used to measure reproductive health capacity. Nearly 36% of the married couples in the sample households ( $n = 12,010$ ) reported being in a cross-cousin marriage, and about 51.2% ( $n = 17,129$ ) of the women are currently using contraceptive methods to delay or prevent pregnancy. Generally, 94.6% ( $n = 31,688$ ) women said their health is okay, good, or very good. Approximately 50% ( $n = 16,760$ ) of the women were married at ages later than 17.6 years. Nearly 56% ( $n = 18,730$ ) women in the sample reported age at menarche as being less than 13.7 years.

Reproductive health knowledge includes the knowledge and beliefs about the effect of environmental and biological determinants of health, such as the nutritional value of milk, the effects of wood-burning smoke, diarrhea, and AIDS awareness. About 73.8% ( $n = 24,703$ ) of women know that it is not harmful to drink one to two glasses of milk every day during pregnancy. In addition, 74.7% ( $n = 25,010$ ) women said that the first thin milk produced after a baby is born is good for the baby. About 81.4% ( $n = 27,250$ ) women indicated that smoke from

a wood/dung-burning traditional chulha is harmful for health. However, when it comes to knowledge of diarrhea, very few knew that when children have diarrhea, they should be given more to drink than usual. Ninety-two percent ( $n = 30,802$ ) of women gave the wrong answer. About 58.3% ( $n = 19,157$ ) women have ever heard of an illness called AIDS.

Three variables are used to measure reproductive health outcome: number of children, number of infant mortalities, and number of miscarriages. About 52.8% ( $n = 17,684$ ) of women in India have fewer than three children (mean number is 2.58). About 82.9% ( $n = 27,748$ ) of women reported that they had no children stillborn. About 84.8% ( $n = 28,395$ ) of women did not have any miscarriages or wasted pregnancies. See Appendix C Table C.1.

#### *5.1.2 Region*

The IHDS-I is a national survey of 41,554 rural and urban households. About 66.8% of the households are located in rural areas ( $n = 22,376$ ) and about 33.2% are in urban areas ( $n = 11,105$ ). The results show that most Indian households in this survey are in rural areas (See Appendix C Table C.2).

#### *5.1.3 Income*

A total of 33,481 households provided data on total annual household income. The mean income is 54,794.31 rupees and standard deviation is 80,289.14. The large standard deviation indicates there is a large poverty gap among Indian households. The maximum annual income is 6,520,261 rupees and the minimum income is -10,8327.8. (The negative income shows that some Indian households are carrying debt.) See Appendix C Table C.3.

#### *5.1.4 Education*

There are 33,046 (98.7%) women who provided information on years of education completed. The total number of cases is 33,481. The average number of years of school completed is 4.63 years and the standard deviation is 4.81 years. The minimum number of years completed is 0 and the maximum is 15. See Appendix C Table C.4.

### 5.1.5 Social Capital

Social capital is composed of three subdimensions: social networks, membership in organizations, and confidence in institutions. Among social networks, only 32.4% of households have relatives who work in hospitals and clinics ( $n = 10,837$ ); about 40.8% of households have relatives working in a school ( $n = 13,565$ ); and about 35% of households have relatives who work in government services ( $n = 11,727$ ).

Membership in organizations includes 11 variables. These variables measure a household's membership in organizations. The distribution of membership among households is as follows: 7.7% households belong to Mahila mandal ( $n = 2,568$ ), a social service organization that helps rural women to improve their health and education. About 5.2% households belong to a youth group ( $n = 1,743$ ); 5.3% households belong to a business or professional group ( $n = 1,771$ ); 10% households belong to a self-help group ( $n = 3,336$ ); 7.4% of households belong to a credit or savings groups ( $n = 2,461$ ); 14.5% of households belong to a religious or social group or festival society ( $n = 4,870$ ); 13.5% of households belong to a caste association ( $n = 4,523$ ); 1.8% of households belong to a development group or NGO ( $n = 607$ ); 3.6% of households belong to agricultural, milk, or other co-operative ( $n = 1,206$ ); 28.9% of households attend public meetings ( $n = 9,661$ ); and 10.3% of households know an official on a village committee ( $n = 3,449$ ).

Confidence in institutions includes 10 variables. About 10.7% of household have great confidence in politicians to fulfill promises ( $n = 3,593$ ). About 85.5% households have great confidence in the military to defend the country ( $n = 28,639$ ), and about 22.9% have great confidence in the police to enforce the law ( $n = 7,680$ ). There are 25.7% of households that have great confidence in the state government to look after the people ( $n = 8,609$ ), about 36% of them have great confidence in newspapers to report the truth ( $n = 12,047$ ), and about 33.2% have great confidence in village *panchayats/ nagarpalika* to implement public projects ( $n = 11,121$ ). There are 68.6% of households that have great confidence in schools to provide a

good education ( $n = 22,966$ ), about 64.2% of them have great confidence in hospitals and doctors to provide good treatment ( $n = 21,484$ ), and about 53.3% have great confidence in courts to mete out justice ( $n = 17,832$ ). There are 87.9% of households that have great confidence in banks for the safe-keeping of money ( $n = 29,438$ ). See Appendix C Table C.5.

According to the results, this study shows that a lot of Indian households do not have a high level of social capital within their society and many households do not have good social networks. As for membership, most Indian households in this study do not belong or know anyone who belongs to any social organization. On the question of confidence level, many people have good confidence in the military, education, or banks but not in government, politicians, and media. This lack of confidence may result in the low level of social capital for each household as well as for the women in these households.

#### *5.1.6 Spousal Communication*

Spousal communication is measured using three variables: do you and your husband talk about farm work (GR18A), what to spend money on (GR18B), and events that happen in the community (GR18C). About 35.3% ( $n = 11,808$ ) of the women usually talk about farm work with their husbands, 42.1% ( $n = 14,109$ ) of women say sometimes, and 20.3% ( $n = 6,785$ ) of them never talk about farm work with their husbands. For “what to spend money on,” 48% ( $n = 16,071$ ) of them say often, 38.2% ( $n = 12,800$ ) say sometimes, and only 11.8% ( $n = 3,952$ ) of the women say never. About 19.6% ( $n = 6,545$ ) of the women usually talk about events that happen in the community with their husbands, 44.8% ( $n = 15,003$ ) of the women say sometimes, and 33.6% of ( $n = 11,253$ ) of them never talk about community events with their husbands. See Appendix C Table C.6.

#### *5.1.7 Autonomy*

Autonomy includes 13 variables. First, the variables relating to “who has the most to say” are cooking, purchase an expensive item, number of children, what to do when a child falls sick, and decides which children should marry. About 94.3% of the women say they have the

most to say on daily cooking ( $n = 31,560$ ), about 71.6% ( $n = 23,982$ ) of the women think they have the most to say in purchasing expensive items, and about 81.1% ( $n = 27,132$ ) of them say they can decide on the number of children they want. About 82.2% ( $n = 27,525$ ) of the women say they have the most to say on deciding how to deal with an ill child, and about 74.6% ( $n = 24,990$ ) say they have most to say on deciding which children should marry.

Second, the permission variables related to “getting permission” to “go to the local health center” and “go to friend’s home.” About 74.3% of the women ( $n = 24,870$ ) have to get permission from their husbands or a senior family member to go to the local health center, and about 74.2% of them ( $n = 24,859$ ) have to get permission from their husbands or a senior family member to go to the home of relatives or friends in the village/neighborhood.

The results of variables related to domestic violence are as follows: about 25.9% ( $n = 8,662$ ) of the women will be beaten if their family does not give the expected dowry money, jewelry, or other items. About 31.9% ( $n = 10,674$ ) of them will be beaten if they neglect the house or the children, and about 26.4% ( $n = 8,848$ ) of them will be beaten if they do not cook the food properly. The number of women who will be beaten if the husband suspects his wife of having relations with other men is 83.2% ( $n = 27,702$ ).

For the variable “How frequently are unmarried girls harassed in your village/neighborhood (GR31),” 3.8% ( $n = 1,268$ ) of the women say often, 14.2% ( $n = 4,750$ ) women say sometimes, and 79.6% ( $n = 26,644$ ) say rarely. In response to the question “Who chooses your husband (MH5A)” 57.6% ( $n = 19,301$ ) of the women say “parents or other relatives alone or other people,” 37.1% ( $n = 12,430$ ) of the women say “Respondent and parents/other relatives together,” and only 5% ( $n = 1,673$ ) of women can chose their husbands by themselves. See Appendix C Table C.7.

In general, in India women’s autonomy level is low. It is found that women in this study need to get permission to go out, experience high risk of domestic violence, and have no right to choose whom to marry.

### *5.1.8 Accessibility*

Accessibility includes five variables. These relate to the accessibility of each household to health care service. About 96.8% households do not have health insurance ( $n = 32,402$ ). Responses to the question “who did you see the last time you had medical treatment,” 26.6% ( $n = 8,892$ ) of households went to a government doctor/nurse, 4.7% ( $n = 1,587$ ) went to a government doctor/ private nurse, 54.5% ( $n = 18,262$ ) of households went to a private doctor/ nurse, 3.5% ( $n = 1,168$ ) went to a pharmacy, and 1.2% ( $n = 416$ ) of households went to a traditional healer.

About 48% ( $n = 16,083$ ) of households went to the health service located in their village/neighborhood, 20.6% ( $n = 6,897$ ) went to another village/neighborhood to get health service, 12.4% ( $n = 4,161$ ) went to other town, and 9.4% ( $n = 3,132$ ) went to the health service located in the district.

About 66.6% ( $n = 22,285$ ) of women in this study say doctors and other health workers treat them nicely, 22.8% ( $n = 7,638$ ) say somewhat nicely, and 0.7% ( $n = 243$ ) say they were not treated nicely. About 28.9% ( $n = 9,690$ ) of them say their medical treatment wait times are more than 21.46 minutes, and 60.4% ( $n = 20,236$ ) say their medical treatment wait times are less than 21.46 minutes. See Appendix C Table C.8.

### *5.1.9 Measures of Hypothesized Variable (Composite Scores)*

The descriptive analysis results of composite scores are shown below. The total number of cases is 33, 481. The mean scores for composite scores are as follow: reproductive health mean score is 8.45 (range 0 to 13), autonomy mean score is 8.13 (range 0 to 13), accessibility mean score is 2.94 (range 0 to 5), spousal communication mean score is 1.69, (range 0 to 3), and social capital mean score is 8.88 (range 0 to 24). The social capital score shows a relatively high standard deviation. See Appendix C Table C.9.

The distribution of each composite score can be examined by using skewness and kurtosis. The acceptable skewness range is from 1 to -1 (Morgan, Leech, Gloeckner, & Barrett,

2004). More skewness shows more variability in scores (Vogt, 1999). The positive number shows the right or positive skewness and the negative number shows the left or negative skewness (Frankfort-Nachmias, & Leon-Guerrero, 2011). The basic rule of kurtosis is that a negative number means flatter than normal distribution and a positive number shows more peaked than normal distribution (Vogt, 1999). The number for normal distribution is 0 (Vogt, 1999). The results presented that almost all composite scores' skewness and kurtosis are located in an acceptable range. Only the reproductive outcome (RHOut) score is a little higher than 1, but the overall reproductive health score is still located in an acceptable range. See Appendix C Table C.10.

In order to do confirmatory factor analysis and structural equation modeling, this study used mean imputation to address missing data. The mean of composite scores with and without missing data are listed in the table (See Appendix C Table C.11). In order to access the mean score differences in the variables constituting the composite scores, a *t* test was conducted. This study used the *t* test to check the significant difference between mean with missing data and mean imputed data for each variable. The results show that there is no difference between mean with missing data and mean imputed data on most composite scores. This means that the imputed method did not influence the original data. Only reproductive health knowledge score, reproductive health score, autonomy score, and social capital score show a difference (See Appendix C Table C.11). This is because the original data set has a huge sample size and the slight difference on mean yielded a significant difference upon *t* test. Even a slight difference on mean will result in important changes on the *t* test; only reproductive health knowledge score, reproductive health score, autonomy score, and social capital score show a difference in this data. Where the difference comes from is still unknown. It may be the difference comes from functional missing or other effects. Therefore, this paper will use data with mean imputed value to analyze the hypotheses.

## 5.2 Multivariate Analysis

### *5.2.1 Composite Model*

This study used regression to analyze the composite model (See Appendix C Figure C.1). The result shows that both spousal communication and social capital have significant effects on Indian women's autonomy and accessibility. As spousal communication or social capital increases, Indian women's autonomy and accessibility increase as well. For example, the total direct effects of spousal communication are as follows: as spousal communication increases by 1 point, Indian women's autonomy increases by .202 points and accessibility by .024 points. The total indirect effect of spousal communication on reproductive health through autonomy and accessibility is .022 points. As social capital increases by 1 point, Indian women's autonomy increases by .028 points and accessibility increases by .011 points. The total indirect effect of social capital on reproductive health through autonomy and accessibility is .004 points.

Region, education, autonomy, and accessibility also suggest significant effects on Indian women's reproductive health. Women who live in an urban area, have a higher education, and have a higher level of autonomy and accessibility also have a higher level of reproductive health. For example, women who live in an urban area improve their reproductive health by .285 points. Indian women who have an additional 1 year of education increase their reproductive health by .137 points. An increase of 1 point of Indian women's autonomy can increase their reproductive health by .087 points. An increase of 1 point of accessibility will improve Indian women's reproductive health by .181 points. See Appendix C Table C.12.

Only income did not present the significant difference on reproductive health ( $p = .163$ ). The covariance between spousal communication and social capital is .204,  $p < .05$ . The correlation between spousal communication and social capital is .089.



### 5.2.2 Structural Equation Modeling

First, the variable in the model, reproductive health, was measuring by multiple indicators. The CFA approach is used to measure reproductive health variables as latent constructs (See Appendix C Figure C.2). When the data are analyzed using the CFA model, the results suggest that the degree of freedom ( $df$ ) is 0. That the degree of freedom equals 0 indicates it is just identified. To conduct CFA, the model should be over-identified ( $df > 0$ ). In order to address the problem of degrees of freedom, the estimate of  $e_1$ ,  $e_2$ , and  $e_3$  were checked. It shows that the estimates of  $e_1$  and  $e_2$  are similar ( $e_1=.738$ ,  $e_2=.782$ ,  $e_3=.555$ ). In order to get 1 degree of freedom, the residual value  $e_1$  and  $e_2$  were fixed as equal. The result shows that chi-squared = 1.723,  $df = 1$ ,  $p = .189$ .

This study used the Goodness-of-Fit Index (GFI), the Adjusted Goodness-of-Fit Index (AGFI), and root mean square error of approximation (RMSEA) to test the goodness of fit statistics. The range of GFI and AGFI are from 0 to 1, when a value greater than .90 can be defined as a good model fit (Byrne, 2010). The value of RMSEA less than .05 indicates a good model fit, a range from .08 to .1 indicates a moderate model fit, and a value greater than .1 means a poor fit (Byrne, 2010). The results of this data show that GFI = 1, AGFI = 1, and RMSEA = .005, which indicate that this CFA model has good fit. The result suggests that all three factor loadings (reproductive health capacity, reproductive health knowledge, and reproductive health outcome) are significant.

Second, structural equation modeling (SEM) can be used to check the goodness-of-fit model and the effects of each of the hypothesized variables on Indian women's reproductive health (See Appendix C Figure C.3). This result suggests that chi-squared = 14192.031,  $df = 33$ ,  $p = .000$ . The Goodness-of-Fit result shows that GFI = .915, AGFI = .859, RMSEA = .113. Even the GFI suggests a good model fit but AGFI and RMSEA did not have a goodness of model fit.

The estimates result shows that all variables have significant influence on Indian women's reproductive health. When spousal communication improves by 1 point, women's autonomy increases .202 point and accessibility by .024 points. The total indirect effect of spousal communication on reproductive health through autonomy and accessibility is .008 points. When social capital increases by 1 point, Indian women's autonomy increases .028 points and accessibility increases .011 points. The total indirect effect of social capital on reproductive health through autonomy and accessibility is .001 points. Women who live in urban areas improve their reproductive health by .105 points. High-income women improve reproductive health by .001 points. When education is expanded by 1 year, reproductive health is improved by .042 points. As Indian women develop their decision-making score by 1 point, their reproductive health score increases by .031 points. In India, when women's ability to access resources improves 1 point, their reproductive health increases by .56 points. Covariance between spousal communication and social capital = .204,  $p < .01$ . Correlations between spousal communication and social capital = .089. See Appendix C Table C.14.

### *5.2.3 Multinomial Regression*

This study analyzed reproductive health at different levels by using multinomial regression. A low level of reproductive health was used as the reference group. The result of comparing (a) middle low level of reproductive health (any three subdimension score is 1) and low level of reproductive health (any three subdimension score is 0), (b) middle level of reproductive health (any three subdimension score is 2) and low level of reproductive health, and (c) high level of reproductive health (any three subdimension score is 3) and low level of reproductive is listed below.

First, at middle low level of reproductive health, region, income, women's educational level, autonomy, and accessibility all suggest significantly different effects on women's reproductive health. Only annual household income at low level and middle level (income32) has the same effect on reproductive health.

The odds of urban women increasing their reproductive health is about 1.2 times that of women who live in rural areas. In addition, the odds of high-income women (income33) increasing their reproductive health is about 1.23 times that of low-income women. The odds of middle-level education (edu22) women improving their reproductive health is 1.44 times that of no education women. The odds of high-level education (edu23) women improving their reproductive health is about 2.38 times that of no education women. The odds of middle-level autonomy (AutoS22) women improving their reproductive health is about 1.23 times that of low-level autonomy women. The odds of high-level autonomy (AutoS23) women improving their reproductive health is 1.95 times that of low-level autonomy women. The odds of middle-level accessibility (AccessS22) women increasing their reproductive health is 1.15 times that of low-level of accessibility women. The odds of high-level accessibility (AccessS23) women increasing their reproductive health is about 1.19 times that of low-level accessibility women. See Appendix C Table C.15.

Second, at middle level of reproductive health, region, income, women's educational level, autonomy, and accessibility all suggest significantly different effects on women's reproductive health in the middle level of reproductive health group, the same as the middle low level of reproductive health group. Only annual household income at low level and middle level (income32) women suggest no different effects on reproductive health.

The odds of urban women increasing their reproductive health is about 1.52 times that of women who live in rural areas. In addition, the odds of high-income women (income33) increasing their reproductive health is about 1.32 times more than low-income women. The odds of middle-level education (edu22) women improving their reproductive health is about 2.1 times more than no education women. The odds of high-level education (edu23) women increasing their reproductive health is about 6.2 times more than no education women. The odds of middle-level autonomy (AutoS22) women improving their reproductive health is about 1.5 times more than low-level autonomy women. The odds of high-level autonomy (AutoS23)

women improving their reproductive health is about 2.62 times more than low-level autonomy women. The odds of middle-level accessibility (AccessS22) women increasing their reproductive health is about 1.31 times more than low-level accessibility women. The odds of high-level accessibility (AccessS23) women increasing their reproductive health is about 1.54 times more than low level of accessibility women. See Appendix C Table C.16.

Third, high level of reproductive health women also have similar results as middle-level and middle low level of reproductive health women. Middle-income women still have the same reproductive health as low-income women. The odds of urban women increasing their reproductive health is about 1.7 times more than women who live in rural areas. In addition, the odds of high-income women (income33) increasing their reproductive health is about 1.32 times more than low-income women. The odds of middle-level education (edu22) women improving their reproductive health is about 3.53 times more than no education women. The odds of high-level education (edu23) women improving their reproductive health is about 23.73 times more than no education women. The odds of middle-level autonomy (AutoS22) women improving their reproductive health is about 1.57 times more than low-level autonomy women. The odds of high-level autonomy (AutoS23) women improving their reproductive health is about 2.87 times that of low-level autonomy women. The odds of middle-level accessibility (AccessS22) women increasing their reproductive health is about 1.27 times more than low level of accessibility women. The odds of high-level accessibility (AccessS23) women increasing their reproductive health is about 1.56 times that of low level of accessibility women. See Appendix C Table C.17.

In sum, this study used composite model, SEM, and multinomial regression to test the hypotheses. Almost all proposed hypotheses are supported by the composite model of the selected variables on women's reproductive health. Only the hypothesis of income is not supported by the composite model. In addition, all proposed hypotheses are supported by SEM of the independent and control variables on women's reproductive health. Lastly, almost all proposed hypotheses are supported by multinomial regression of selected determinates on

women's reproductive health. Only the hypothesis of income partially supported the hypotheses.

See Appendix C Table C.18.

## CHAPTER 6

### DISCUSSION AND IMPLICATIONS

#### 6.1 Discussion

According to the findings of this study, both social and economic factors have a significant positive effect on women's reproductive health in India. This chapter discusses the effects of those factors. First, a composite score regression found that income has no effect on women's reproductive health in India, but most of the literature indicates that income is highly related to women's reproductive health (Ensor & Cooper, 2004). The multinomial regression results may offer a possible explanation of this discrepancy. According to the multinomial regression finding, income has no effect on women's reproductive health between women with low income (110,000 rupees to 20,000 rupees) and middle income (30,000 rupees to 50,000 rupees), but income suggests a significant positive effect on women's reproductive health between low income and high income (60,000 rupees to 6,520,000 rupees). The reason for this finding may be due to the fact that households with income below 50,000 rupees are still considered to be low income. The mean income in this study is about 54,794.32 rupees. Annual income below 50,000 rupees is still lower than average and at that level the accessibility and availability of social resources are still limited.

Region may be an important factor for women's reproductive health in India. The findings of this study suggest that women who live in urban areas have higher levels of reproductive health than women who live in rural or slum areas. Ensor and Cooper (2004) suggest that social capital is related to the way people access health care services, and Jejeebhoy (1997) states that the quality of health services is related to reproductive health. Quality of life can be seen as the availability and accessibility of health care services. Urban areas offer more public transportation systems and have more health care services than rural areas, and these

limitations of social resources that relate to women's reproductive health may be reduced in urban areas. In addition, urban areas may have more jobs and educational opportunities. Women will therefore have more opportunities to get the reproductive health knowledge and access to high-quality health care services.

Education seems to be an important factor in women's reproductive health in India. Researchers state that women who have higher educational levels are more likely to have higher level of reproductive health and receive improved maternal care (Bitler & Schmidt, 2006; DeJong et al., 2005; Finer & Henshaw, 2006). In addition, when women expand their education years, they are more likely to delay their age of having children through contraceptive use. Moreover, women who have a higher educational level may have more awareness of their own reproductive rights and autonomy. Pillai and Gupta (2006) conclude that reproductive health is positively related to reproductive rights and gender equality. Therefore, women can increase their reproductive health through increasing their educational level.

An evaluation of the mean scores of composite scores reveal a few interesting facts. According to the composite scores results, the means of reproductive health ( $M = 8.45$ , range 0–13), autonomy ( $M = 8.13$ , range 0–13), accessibility ( $M = 2.94$ , range 0–5), and spousal communication ( $M = 1.69$ , range 0–3) have values that can be considered relatively high. Only the mean of social capital ( $M = 8.88$ , range 0–24) is relatively low. These results point to a few aspects of women's social status in India today. In the past, women's autonomy and accessibility in India were low. But the Indian government started to recognize that women have similar health needs as men (Bandyopadhyay & MacPherson, 1999), and in order to improve the health of both men and women, the government launched several health-related programs for its people and made Primary Health Care Centers available in rural India (Bandyopadhyay & MacPherson, 1999). Through these changes, Indian women's health and accessibility to health care were considerably improved. In the future, more studies need to be done in the areas of women's health and social status in India.

## 6.2 Limitations

This study has several limitations. First, due to time limitations and the search tool, the researcher could not search all words related to reproductive health; therefore, the literature review may not be totally exhausted. Second, this study used secondary data to test the hypotheses. The primary source, the India Human Development Survey I (IHDS-I 2004-2005), was not conducted for testing reproductive health behavior. As a national study, IHDS-I includes different kinds of daily life data; reproductive health data are just a small part of it. The data do not offer all of the reproductive health variables that this study needed. Other composite variables such as spousal communication, social capital, women's autonomy, and accessibility all suffer from the data limitations.

Third, IHDS-I includes a lot of missing data, which further limited the selection used in this study. IHDS-I interviewed 41,554 urban and rural households from almost all states and union territories of India. In a national survey, missing data may occur for many reasons. For example, participants may not understand the research questions and not be able to offer the answers. In addition, some households may not have eligible participants. For example, if women do not have children, they will not be able to answer all of the pregnancy-related questions.

Finally, in order to test CFA and SEM models, this study used mean impute to deal with missing data. Even a *t* test suggests no difference between data with missing value and mean imputed data for most variables. However, some changes can still be made. Therefore, the results may not present the overall reality of women's reproductive health in India. Some other statistical methods may be used to deal with missing data in the future.

## 6.3 Implications

Social work implications can be discussed in five dimensions: social work practice, policy, education, research, and empirical framework. For social work practice, social workers can help in poverty eradication via provision of social services and reproductive choices. The



study results indicate that greater accessibility will increase women's reproductive health as well. The improvement of social services can directly improve accessibility. For example, encouraging condom use or family planning programs can help women decide when or whether to have children. In addition, the lack of transportation services or medical offerings can reduce women's ability to access reproductive health services. Moreover, social workers can empower women at the family level. From the study results, increasing spousal communication and women's autonomy will result in the improvement of their reproductive health. Family dynamics can be an important factor of women's reproductive health, and social workers can offer a spousal communication program or family dynamics program to encourage communication within the family so that women can have more opportunities to express their needs and make their own choices.

At the policy level, this study can help shape social policies that will improve reproductive rights and choices for Indian women. Reproductive rights include the ability to make reproductive health decisions, and one way to improve decision-making skills is to improve autonomy and accessibility. Social workers can advocate or shape policies that reduce the barriers to autonomy and accessibility—protecting women's right to work and to access education, for example. The results of this study indicate that women's educational level and high income both play an important role in reproductive health in India, as women with more education and income have more freedom to make their own decisions. In addition, public transportation systems and medical service centers can be included in social policy. For example, establishing public transportation systems in rural areas would help reduce the barriers to resource accessibility. Developing health service centers can also increase reproductive health accessibility, as women would have more chances to access reproductive health services and the autonomy to decide where to get the services, thereby improving their reproductive health.

As for social work education, reproductive rights and choices need to be included in advocacy classes. As a service provider and educator, social workers in India need to know how to increase women's reproductive rights and choices. Classes in sex education, family dynamics, empowerment, and spousal communication can help improve reproductive rights and awareness of choices. Social workers need to learn how to empower women so that they can improve the level and quality of services, influence social policy, and ultimately improve women's reproductive health.

At the research level, several topics need to be included in future studies. First, more studies need to be done in the area of spousal communication, education, social capital, income, autonomy, and accessibility—areas that have been shown to improve reproductive health. This study offers a way to review the effects of social and economic factors on reproductive health in India. Future studies need to pay more attention to both social and economic factors that influence women's reproductive health. More details are needed. In addition, more background variables need to be examined. In this study, only spousal communication and social capital were examined. Other structural variables such as political power and women's participation in the labor force can be included in future studies. Moreover, health communication is also important to future research. Even though this study offers some direction to increase women's reproductive health in India, how to translate these findings to the larger Indian society is also a critical issue. How to offer the reproductive health-related information to general populations is another issue that future researchers need to consider. One possible way to do so may be through media or social policies. For example, community newspapers, TV shows, and radio could be used to help spread information. The details of how to translate reproductive health information for people to understand needs future researchers' efforts.

At the level of empirical framework, this study offers a new perspective for examining women's reproductive health in India and developing countries. Most of the prior studies on

women's reproductive health in India focused on the effects of either social or economic factors. But this study used an empirical framework for both social and economic factors and found that both of those factors have significant effects on women's reproductive health in India. This study offers an empirical framework suitable for exploring and assessing the effect of several socio-economic factors on women's reproductive health. The frame may be used for developing health policies and programs for Indian women. In addition, this framework can also be used in program evaluation, health data analysis, and future studies in women's reproductive health in India and developing countries.

#### 6.4 Conclusion

Indian women's reproductive health has become an important issue recently. Most studies related to women's reproductive health discuss either economic or social factors, but only few studies mention both. This study used the India Human Development Survey I (IHDS-I 2004-2005) data to test the effects of socioeconomic and choices factors on women's reproductive health. Descriptive analysis, regression, SEM, and multinomial regression were used to examine the hypotheses. In order to deal with missing data, the mean of each age group was imputed in each variable. Six independent variables (spousal communication, social capital, income, education, autonomy, and accessibility), one control variable (region), and a dependent variable (reproductive health) were included in the proposed and tested model. Regression was used to examine the effects of independent and control variables on women's reproductive health. The CFA examined the goodness-of-model fit and SEM examined the effects of both economic and social factors on women's reproductive health. The last method, multinomial regression, examined the effects of dependent and control variables on reproductive health in different health categories.

In many studies, income shows an important effect on women's reproductive health. But in this study, income did not appear to have an important effect on all three proposed models. In the regression model, income did not present a significant different effect on

women's reproductive health. In multinomial regression, middle-income women and low-income women present the same reproductive health. Income appears as an important factor only in SEM.

Region, as a control variable, suggests a significant effect on all three proposed models. Urban women have higher levels of reproductive health than rural women, which may be because urban women have more health care accessibility than rural women. In addition, education, autonomy, and accessibility have positive direct effects on women's reproductive health in all three proposed models. Women who have higher levels of education are more likely to improve their reproductive health. Not many studies have discussed autonomy and accessibility on women's reproductive health, but this study suggests that autonomy and accessibility are both important to women's reproductive health. Autonomy indicates the ability to make decisions. When women increase their right to decide when to have children or where to get health care, they are more likely to improve their reproductive health. Accessibility indicates the availability and accessibility of resources. When women have more chances to access the health care resources, they are more likely to increase their reproductive health.

Lastly, spousal communication and social capital have an indirect positive effect on women's reproductive health in all three models as well. Not many studies have discussed the effects of spousal communication and social capital through autonomy and accessibility on women's reproductive health. This study suggests a way to improve women's reproductive health by increasing the communication between spouses and the social capital among the society, because when spousal communication and social capital increase, women are more likely to increase their ability to make decisions and ability to access resources. Therefore, women's reproductive health can be increased as well.

Based on the findings, this study concludes that both social factors and economic factors have important effects on women's reproductive health in India. Social workers can use these findings to improve women's reproductive health in India. Through social services, social

policy making, education, and research, social workers can improve women's spousal communication, social capital, income, autonomy, and accessibility, which in turn will improve women's reproductive health in India.

APPENDIX A  
EMPIRICAL MODEL

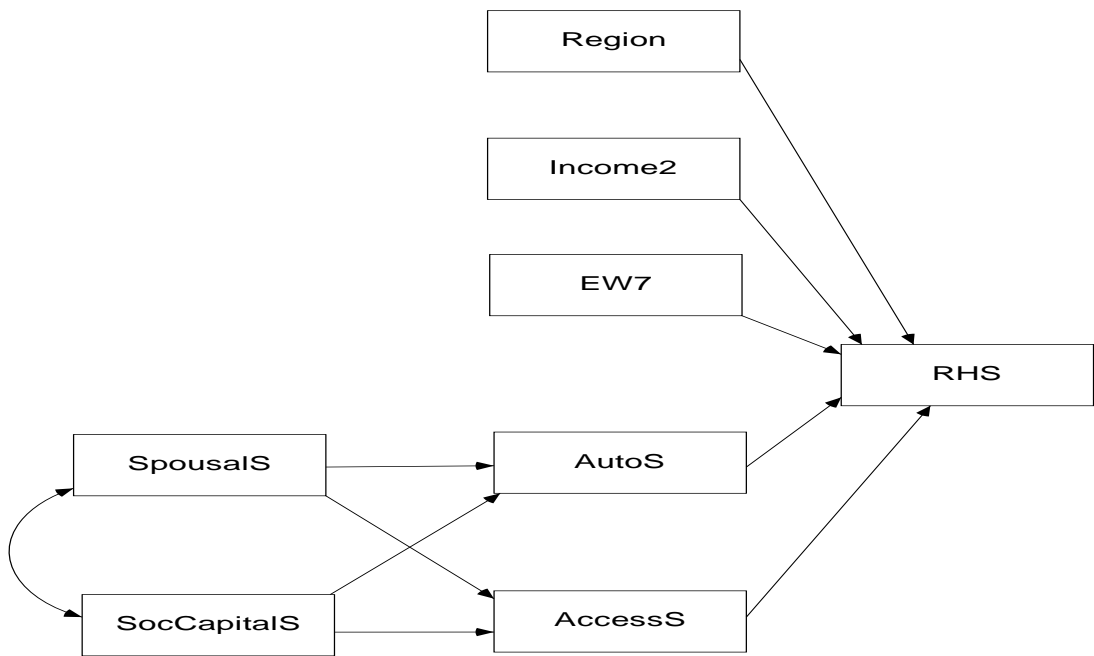


Figure A.1 Empirical Model

APPENDIX B  
METHODOLOGY TABLES AND FIGURES



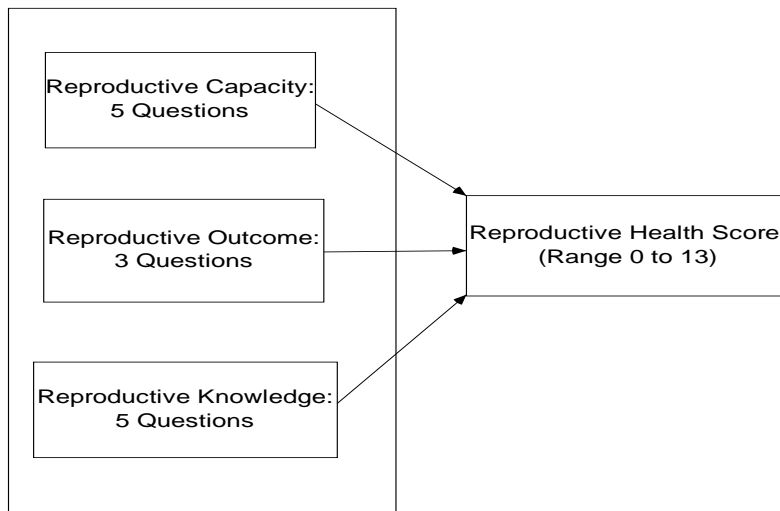


Figure B.1 Reproductive Health Measured as a Composite of Three Subdimensions

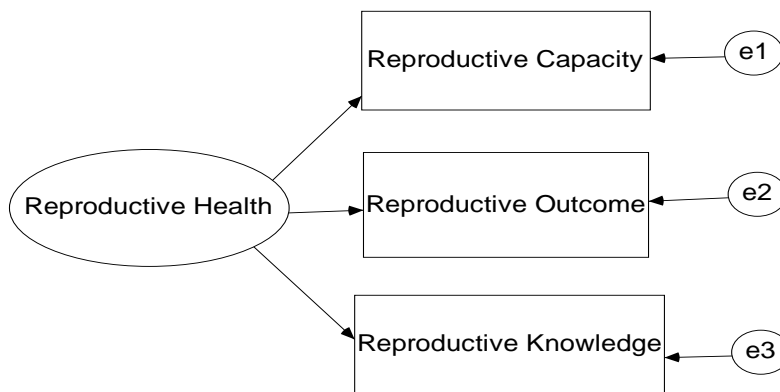


Figure B.2 Reproductive Health as Latent Construct Measured by Three Indicators

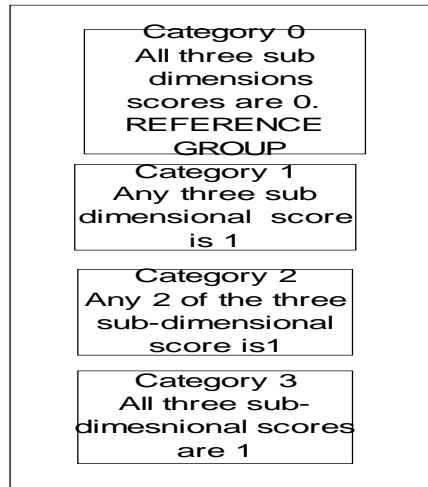


Figure B.3 Reproductive Health Measured at the Nominal Level with Four Categories

Table B.1 Variables of Reproductive Health

Question	Options	Recoded
Reproductive health capacity (RHCapS)= MP2+FP2A+EW9+MH1A+MH2C	Score range from 0-5	0 to 2 recoded as 0 2.01 to 5 recoded as 1
4.2 Did anyone marry a daughter to her cousin? (MP2)	No=0 Yes=1	Yes=0 No=1
20.2a Are you and your husband currently using any methods to delay or prevent pregnancy? (FP2A)	No=0 Yes=1	No=0 Yes=1
13.9 In general, would you say your own health is? (EW9)	Very good=1 Good=2 Ok=3 Poor=4 Very poor=5	Very poor=0 Poor=0 Ok=1 Good=1 Very good=1
17.1a How old were you when you got married? (MH1A)		Equal and below the mean (17.59)=0 Above the mean(17.59)=1
17.2c How old were you when you first started having your periods? (MH2C)		Equal and above the mean (13.74)=0 Below the mean (13.74)=1
Reproductive health knowledge (RHKnowS)=HB1+HB+HB4+HB5+A11	Score range from 0-5	0 to 2 recoded as 0 2.01 to 5 recoded as 1
14.1 Is it harmful to drink 1-2 glasses of milk everyday during pregnancy? (HB1)	No=0 Yes=1	Yes=0 No=1
14.3 Do you think that the first thin milk that comes out after a baby is born is good for the baby, harmful for the baby, or it doesn't matter? (HB3)	Good=1 Harmful=2 Doesn't matter=3	Harmful=0 Doesn't matter=0 Good=1
14.4 Is smoke from a wood/dung burning traditional chulha good for the health, harmful for health or do you think it doesn't really matter? (HB4)	Good=1 Harmful=2 Doesn't matter=3	Good=0 Doesn't matter=0 Harmful=1
14.5 When children have diarrhea, do you think that they should be given less to drink than usually more to drink, about the same, or it doesn't matter? (HB5)	Less than usual=1 More than usual=2 About the same=3 It doesn't matter=4	Less than usual=0 Doesn't matter=0 About the same=0 More than usual=1
15.1 Have you ever heard of an illness called AIDS? (A11)	No=0 Yes=1	No=0 Yes=1
Reproductive health outcome (RHOutS)=EW8+FH7B+FH7C	Score 0-3	0 to 2 recoded as 0 2.01 to 3 recode as 1

Table B.1 – *Continued*

13.8 Number of children (EW8)	Equal and above the mean (2.58)=0 Below the mean (2.58)=1
18.7a Any children dead at birth (FH7B)	Yes (number 1-10)=0 No (number 0)=1
18.7b How many miscarriages or wasted pregnancies? (FH7C)	Yes (number 1-10)=0 No (number 0)=1

Table B.2 Variables of Region

Question	Options	Recoded
EH3 1.9 Region (HI9)	Rural =1 (64.7%) Urban=2 (33.2%) Slum=3 (2.1%)	Rural & Slum=0 Urban=1

Table B.3 Variables of Income

Variable	Question
Farm Income	<p>4 Now, I would like to ask you about what crops you grew in the last 12 months. Now, I would like to ask you a little more about each of these crops.</p> <p>4.6a Total agricultural land rented out or sharecropped out:</p> <p>4.6c How much cash do you receive during a year for this land.</p> <p>4.6e About how much was that (crop) worth last year?</p> <p>4.32 Does this household own any..</p> <p>4.32i How much money did you make renting out any equipment?</p> <p>4.8a Total agricultural land rented in or sharecropped</p> <p>4.8c [IF CASH]: About how much do you pay during a year for this land?</p> <p>4.16 If rented in-what share went to landlord?</p> <p>4. 18 What price did you get for this crop?</p> <p>4.19 What is the value of the crop residue</p> <p>4.19a Value of the crop residue sold?</p> <p>4.19b Value of the crop residue kept for own use? (e.g.) for fuel, animal fodder, etc.</p> <p>4.20 During the last 12 months did you hire any <i>labor</i> from outside your household?</p> <p>4.20b How many rupees did you spend all last year on hired labor?</p> <p>4.20c Did you also usually give these workers a meal? [IF YES] How many meals each day did you give? IF NONE, ENTER ZERO</p> <p>4.21 What was the value of the seeds you used last year? [IF NONE, ENTER ZERO]</p> <p>4.22 How many rupees did you spend all last year on fertilizer and manures? [IF NONE, ENTER ZERO]</p>

Table B.3 – Continued

	<p>4.23 How many rupees did you spend all last year on pesticides and herbicides? [ IF NONE, ENTER ZERO]</p> <p>4.24 Did you purchase any <i>water for irrigation</i> for your crops? How many rupees did you spend all last year on water? [IF NONE, ENTER ZERO]</p> <p>4.25 Did you hire any <i>tractors or equipment</i> or hire any <i>animals</i> for working on your farm? [IF YES] How many rupees did you spend all last year on animals and equipment? [IF NONE, ENTER ZERO]</p> <p>4.26 Did you make any agricultural loan installment payments last year? How many rupees did you spend all last year on loan repayments? [IF NONE, ENTER ZERO]</p> <p>4.27 Did you spend any other money for your farm last year? For instance, on maintaining your machines, transporting crops, on diesel, electricity, etc.? [IF YES] How many rupees did you spend all last year on these expenses? [IF NONE, ENTER ZERO]</p> <p>5.1 Does this household own any livestock such as cows, buffalo, goats, or chickens? [IF YES, RECORD NUMBER OF ANIMALS OF EACH TYPE:] [IF NO, ENTER ZERO IN FIRST LINE]</p> <p>5.1a Milch cows?</p> <p>5.1b Milch buffalo?</p> <p>5.1c Draft animals? bullocks, donkeys, buffalo</p> <p>5.1e Sheep?</p> <p>5.2a How much money did you make selling milk &amp; eggs in the last year?</p> <p>5.2b How much money did you make selling chicken &amp; livestock in the last year?</p> <p>5.4 How much was the cost of feeding, maintaining, and grazing the animals?</p> <p>5.4a Value of home grown grain?</p> <p>5.4b Value of home grown crop residue?</p> <p>5.4c Value of purchased residue/grains?</p> <p>12 Please tell me how much of these items have been <i>consumed</i> by this household <i>in past 30 days</i>:</p> <p>12.8 Meat, Chicken and Fish</p> <p>12.11 Eggs</p> <p>12.12 Milk</p> <p>12.13 Milk products like ghee, butter, ice cream, milk powder, dahi, paneer, etc.</p>
Salary Income	<p>6 Now, [besides work on the household farm or in any of the household's businesses,] what work for pay or goods did [NAME] DO LAST YEAR?</p> <p>6.8 How much was the NAME paid in cash for this work? (monthly/ annual pay)</p>
Agricultural Wages	<p>6 Now, [besides work on the household farm or in any of the household's businesses,] what work for pay or goods did [NAME] DO LAST YEAR?</p> <p>6.8 How much was the NAME paid in cash for this work? (daily, agricultural occupations)</p>
Nonagricultural Wages	<p>6 Now, [besides work on the household farm or in any of the household's businesses,] what work for pay or goods did [NAME] DO LAST YEAR?</p>

Table B.3 – Continued

	6.8 How much was the NAME paid in cash for this work? (daily, all other non-agricultural works)
Remittances	3 Non-Resident Family Members 3.13 How much money has NAME sent/ received in the household in past 12 months?
Nonfarm Business Income	7 Does anybody in this household run their own business, however big or small? 7.3 What was the gross receipt from this business over the last 12 months? Did you hire any workers last year? 7.5 How much was paid in all other expenses such as the costs of materials, rent, interest on loans, etc.
Public Benefits	8 Has anyone in the household received any income Now, I would like to ask, if anyone in the household has participated from any other source last year? 8.5 Income from scholarships /Charities or gifts? Now, I would like to ask, if anyone in the household has participated in the following programs? [IF NO, ENTER "0"] 8.7 National Old Age dividends Pension Scheme 8.8 Widows' Pension Scheme (WPS) 8.9 National Maternity Scheme (NMBS) 8.10 National Disability Pension 8.11 Annapurna (note value of grain) 8.12 Other Government Programmes (including income generation) 8.13 Assistance from NGOs /Charities
Other Income	8 Has anyone in the household received any income Now, I would like to ask, if anyone in the household has participated from any other source last year? 8.1 Income from renting property? 8.2 Income from interest, dividends, or capital gains? 8.3 Income from pensions? 8.3a govt. work, including military? 8.3b from any private work? 8.16 Income from any other source?

Table B.4 Variable of Education

Variable	Question
EW7 EWomen: Education	13 I am now going to ask you some questions about your opinions, your life and your children. 13.7 Years of education completed (5th class=5, BA/Bsc.=15)

Table B. 5 Variables of Social Capital

Question	Options
Social Network	
15.1a Among your acquaintances and relatives, are there any who are doctors or nurses or who work in hospitals and clinics. (SN1A)	No=0 Yes=1
15.2a Among your acquaintances and relatives are there any who are teachers, school officials, or anybody who works in a school. (SN2A)	No=0 Yes=1
15.3a Among your acquaintances and relatives, are there any who are in government service. (SN3A)	No=0 Yes=1
Membership in Organizations	
16.1 Does anybody in the household belong to a Mahila mandal? (ME1)	No=0 Yes=1
16.2 Does anybody in the household belong to a youth club, sports group, or reading room? (ME2)	No=0 Yes=1
16.3 Does anybody in the household belong to a trade union, business or professional group? (ME3)	No=0 Yes=1
16.4 Does anybody in the household belong to a self help group? (ME4)	No=0 Yes=1
16.5 Does anybody in the household belong to a credit or savings groups? (ME5)	No=0 Yes=1
16.6 Does anybody in the household belong to a religious or social group or festival society? (ME6)	No=0 Yes=1
16.7 Does anybody in the household belong to a caste association? (ME7)	No=0 Yes=1
16.8 Does anybody in the household belong to a development group or NGO? (ME8)	No=0 Yes=1
16.9 Does anybody in the household belong to agricultural, milk, or other co-operative? (ME9)	No=0 Yes=1
16.11 Have you or anyone in the household attended a public meeting called by the village panchayat/ nagarpalika/ ward committee in the last year. (ME11)	No=0 Yes=1
16.12 Is anyone in the household an official of the village panchayat/ nagarpalika/ ward committee? Is there anyone close to the household, who is a member? (ME12)	Nobody close to household is a member = 0 Somebody close to household is a member = 0.5 Someone in household is a member = 1

Table B.5 – *Continued*

<p>Confidence in Institutions                      19 As far as the people running these institutions are concerned, would you say you have                      A great deal of confidence =1                      Only some confidence =2                      Hardly any confidence at all in them =3                      In following institutions?</p>	<p>Recoded</p>
<p>19.1 Would you say you have confidence in politicians to fulfill promises? (CI1)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.2 Would you say you have confidence in the military to defend the country? (CI2)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.3 Would you say you have confidence in the police to enforce the law? (CI3)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.4 Would you say you have confidence in the state government to look after the people? (CI4)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.5 Would you say you have confidence in newspapers to print the truth? (CI5)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.6 Would you say you have confidence in village panchayats/ nagarpalika to implement public projects? (CI6)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.7 Would you say you have confidence in schools to provide good education? (CI7)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.8 Would you say you have confidence in hospitals and doctors to provide good treatment? (CI8)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.9 Would you say you have confidence in courts to meet out justice? (CI9)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>
<p>19.10 Would you say you have confidence in banks to keep money safe? (CI10)</p>	<p>Hardly any confidence at all in them =0                      Only some confidence =0.5                      A great deal of confidence =1</p>



Table B.6 Variables of Spouse Communication

Question	Options
16.18a Do you and your husband talk about things that happen (at work/on the farm) often, sometimes, never? (GR18A)	Never=0 Sometimes=0.5 Often=1
16.18b Do you and your husband talk about what to spend money on? (GR18B)	Never=0 Sometimes=0.5 Often=1
16.18c Do you and your husband talk about things that happen in the community such as elections or politics? (GR18C)	Never=0 Sometimes=0.5 Often=1

Table B.7 Variables of Autonomy

Question	Options
16.1 Who has the most say in what to cook on a daily basis (respondent)? (GR1A)	No=0 Yes=1
16.2 Who has the most say in whether to buy an expensive item such as TV or fridge (Respondent)? (GR2A)	No=0 Yes=1
16.3 Who has the most say in how many children you have (Respondent)? (GR3A)	No=0 Yes=1
16.4 Who has the most say on what to do if a child falls sick (Respondent)? (GR4A)	No=0 Yes=1
16.5 Who has the most to say in the decision to which your children should marry (Respondent)? (GR5A)	No=0 Yes=1
16.6 Do you have to ask permission of your husband or a senior family member to go to the local health Center? (GR6A)	Yes=0 No=1
16.7 Do you have to ask permission of your husband or a senior family member to go to the home of relatives or friends in the village/neighborhood? (GR7A)	Yes=0 No=1
16.22 In your community is it usual for husbands to beat their wives if her natal family does not give expected money, jewelry or other items? (GR22)	Yes=0 No=1
16.23 In your community is it usual for husbands to beat their wives if she neglects the house or the children? (GR23)	Yes=0 No=1
16.24 In your community is it usual for husbands to beat their wives if she doesn't cook food properly? (GR24)	Yes=0 No=1

Table B.7 – Continued

16.25 In your community is it usual for husbands to beat their wives if he suspects her of having relations with other men? (GR25)	Yes=0 No=1
16.31 How frequently are unmarried girls harassed in your village/neighborhood? Rarely=1, sometimes=2, often=3	Recoded Often=0 Sometimes=0.5 Rarely=1
17.5a Who chose your husband? Respondent herself=1, Respondent and parents / other relatives together=2, Parents or other relatives alone=3, other=4 (MH5A)	Recoded Parents or other relatives alone=0 Other=0 Respondent and parents / other relatives together=0.5 Respondent herself=1

Table B.8 Variables of Accessibility

Question	Options (original)	Recoded
9.3 Does anybody in the household have health insurance? (RC3)	No=0 Yes=1	
11.1 The last time you (the respondent) had to visit a clinic, a hospital, a healer for a minor illness such as a fever cough/cold or diarrhea, for yourself or your children, who did you see (QC1)	Govt Dr/Nurse=1 Govt Dr/Nurse in pvt=2 Pvt Dr/nurse=3 Pharmacy=4 Other (traditional healer)=5	Other (traditional healer)=0 Pharmacy=0.25 Pvt Dr/nurse=0.5 Govt Dr/Nurse in pvt=0.75 Govt Dr/Nurse=1
11.2 Where was it located? (QC2)	Village/neighborhood=1 Another village/neighborhood=2 Other town=3 District town=4	District town=0 Other town=0.33 Another village/neighborhood=0.67 Village/neighborhood=1
11.6 Do doctors and other health workers treat you? (QC6)	Nicely=1 Somewhat nicely=2 Not nicely=3	Not nicely=0 Somewhat nicely=0.5 Nicely=1
11.7 Usually when you go to this facility how many minutes do you have to wait? (QC7)		Above the mean (21.46)=0 Equal and below the mean (21.46)=1

Table B.9 Multinomial Regression Variables Cumulative Percentage Table

Variable	Cumulative Percentage	Code
Income	-11 to 2: 38.7%	-11 to 2: 1
	3-5: 68.8%	3-5: 2
	6-652: 100%	6-652: 3
Education	0: 42%	0: 1
	1-7: 68.3%	1-7: 2
	8-15: 100%	8-15: 3
Autonomy	0-7: 34.5%	0-7: 1
	7.01-9: 66.6%	7.01-9: 2
	9.01-13: 100%	9.01-13: 3
Accessibility	0.5-2.75: 33.9%	0.5-2.75: 1
	2.76-3.25: 66.8%	2.76-3.25: 2
	3.26-5: 100%	3.26-5: 3

APPENDIX C  
RESULTS TABLES AND FIGURES

Table C.1 Descriptive Results of Reproductive Health

Variables	Categories	Frequencies (%)	Missing (%)
<b>RH Cap</b>			
4.2 Marry daughter cousin? (MP2)	Yes=0	12,010 (35.9)	120 (0.4)
	No=1	21,351 (63.8)	
	Total	33,361/33,481	
20.2a Contraceptive usage (FP2A)	No=0	13,169 (39.3)	3,183 (9.5)
	Yes=1	17,129 (51.2)	
	Total	30,298/33,481	
13.9 General health (EW9)	Poor or Very poor=0	1,793 (5.4)	0
	Ok, Good, and Very good=1	31,688 (94.6)	
	Total	33,481	
17.1a Age at marriage (MH1A)	Equal and below the mean(17.59)=0	16,682 (49.8)	39 (0.1)
	Above the mean(17.59)=1	16,760 (50.1)	
	Total	33,442/33,481	
17.2c Age at first period (MH2C)	Equal and above the mean (13.74)=0	18,730 (55.9)	72 (0.2)
	Below the mean (13.74)=1	14,679 (43.8)	
	Total	33,409/33,481	
<b>RH Know</b>			
14.1 Daily milk (HB1) Table C.1 – <i>Continued</i>	Yes=0	7,040 (21.0)	1,738 (5.2)
	No=1	24,703 (73.8)	
	Total	31,743/33,481	
14.3 First thin milk (HB3)	Harmful and Doesn't matter =0	8,064 (24.1)	407 (1.2)
	Good=1	25,010 (74.7)	
	Total	33,074/33,481	
14.4 Chulha smoke (HB4)	Good and Doesn't matter =0	5,995 (17.9)	236 (0.7)
	Harmful=1	27,250 (81.4)	
	Total	33,245/33,481	
14.5 Diarrhea: water (HB5)	Less than usual, Doesn't matter, and About the same =0	30,802 (92.0)	2,679(8.0)
	More than usual=1	0	
	Total	30,802/33,481	
15.1 AIDS awareness (AI1)	No=0	13,698 (40.9)	266 (0.8)
	Yes=1	19,517 (58.3)	
	Total	33,215/33,481	
<b>RH Out</b>			
13.8 Number of children (EW8)	Equal and above the mean (2.58)=0	15,711 (46.9)	86 (0.3)
	Below the mean (2.58)=1	17,684 (52.8)	
	Total	33,395/33,481	
18.7a Children dead at birth (FH7B)	Yes (number 1-10)=0	3,868 (11.6)	1,866 (5.6)
	No (number 0)=1	27,747 (82.9)	
	Total	31,615/33,483	
18.7b Miscarriages (FH7C)	Yes (number 1-10)=0	2731 (8.2)	2,355 (7.0)
	No (number 0)=1	28,395 (84.8)	
	Total	31,126/33,481	

Table C.2 Descriptive Results of Region

Variables	Categories	Frequencies (%)	Missing (%)
Region (HI9)	Rural	22,376 (66.8)	0
	Urban	11,105 (33.2)	
	Total	33,481/33,481	

Table C.3 Descriptive Results of Income

Variable	Frequencies (%)	Mean	Std Deviation	Missing (%)
Income	33,481 (100)	54,794.31	80,289.14	0

Table C.4 Descriptive Results of Education

Variable	Frequencies	Mean	Std Deviation	Missing (%)
EW7 EWomen: Education	33,046 (98.7)	4.63	4.81	435 (1.3)

Table C.5 Descriptive Results of Social Capital

Variables	Categories	Frequencies (%)	Missing (%)
<b>Social Network</b>			
15.1a Network: medical (SN1A)	No=0	22,297 (66.6)	347 (1.0)
	Yes=1	10,837 (32.4)	
	Total	33,134/33,481	
15.2a Network: school (SN2A)	No=0	19,429 (58.0)	396 (1.2)
	Yes=1	13,656 (40.8)	
	Total	33,085/33,481	
15.3a Network: government service (SN3A)	No=0	21,225 (63.4)	529 (1.6)
	Yes=1	11,727 (35.0)	
	Total	32,952/33,481	
<b>Membership in Organizations</b>			
16.1 Member Mahila mandal? (ME1)	No=0	30,862 (92.2)	51 (0.2)
	Yes=1	2,568 (7.7)	
	Total	33,430/33,481	
16.2 Member youth /sports / reading (ME2)	No=0	31,693 (94.7)	45 (0.1)
	Yes=1	1,743 (5.2)	
	Total	33,436/33,481	
16.3 Member trade union/ business/ professional (ME3)	No=0	31,662 (94.6)	48 (0.1)
	Yes=1	1,771 (5.3)	
	Total	33,433/33,481	
16.4 Member self help group (ME4)	No=0	30,099 (89.9)	46 (0.1)
	Yes=1	3,336 (10.0)	
	Total	33,435/33,481	

Table C.5 – Continued

16.5 Member credit/ savings groups (ME5)	No=0 Yes=1 Total	30,971 (92.5) 2,461 (7.4) 33,432/33,481	49 (0.1)
16.6 Member religious/ social (ME6)	No=0 Yes=1 Total	28,565 (85.3) 4,870 (14.5) 33,435/33,481	46 (0.1)
16.7 Member caste association (ME7)	No=0 Yes=1 Total	28,909 (86.3) 4,523 (13.5) 33,432/33,481	49 (0.1)
16.8 Member development group/ NGO (ME8)	No=0 Yes=1 Total	32,821 (98.0) 607 (1.8) 33,428/33,481	53 (0.2)
16.9 Member cooperative (ME9)	No=0 Yes=1 Total	32,205 (96.2) 1,206(3.6) 33,411/33,481	70 (0.2)
16.11 Attend public meeting (ME11)	No=0 Yes=1 Total	23,744 (70.9) 9,661 (28.9) 33,405/33,481	76 (0.2)
16.12 Official of the village panchayat/ nagarpalika/ ward committee (ME12)	Nobody close to household is a member = 0 Somebody close to household is a member = 0.5 Someone in household is a member=1 Total	29,888 (89.3) 2,976 (8.9) 473 (1.4) 33,337/33,481	144 (0.4)
Confidence in Institutions			
19.1 Politicians promises (C11)	Hardly any confidence at all in them =0 Only some confidence =0.5 A great deal of confidence =1 Total	19,030 (56.8) 10,643 (31.8) 3,593 (10.7) 33,266/33,481	215 (0.6)
19.2 Military to defend the country (C12)	Hardly any confidence at all in them =0 Only some confidence =0.5 A great deal of confidence =1 Total	825 (2.5) 3,660 (10.9) 28,639 (85.5) 33,124/33,481	357 (1.1)
19.3 Police to enforce the law (C13)	Hardly any confidence at all in them =0 Only some confidence =0.5 A great deal of confidence =1 Total	9,508 (28.4) 16,060 (48.0) 7,680 (22.9) 33,248/33,481	233 (0.7)

Table C.5 – *Continued*

19.4 Government to look after the people (CI4)	Hardly any confidence at all in them =0	7,436 (22.2)	417 (1.2)
	Only some confidence =0.5	17,019 (50.8)	
	A great deal of confidence =1	8,609 (25.7)	
	Total	33,064/33,481	
19.5 Newspapers to print the truth (CI5)	Hardly any confidence at all in them =0	2,615 (7.8)	2,295 (6.9)
	Only some confidence =0.5	16,524 (49.4)	
	A great deal of confidence =1	12,047 (36.0)	
	Total	31,186/33,481	
19.6 Panchayats/ nagarpalika to implement public projects (CI6)	Hardly any confidence at all in them =0	6,286 (18.8)	568 (1.7)
	Only some confidence =0.5	15,506 (46.3)	
	A great deal of confidence =1	11,121 (33.2)	
	Total	32,913/33,481	
19.7 Schools to provide good education (CI7)	Hardly any confidence at all in them =0	1,951 (5.8)	324 (1.0)
	Only some confidence =0.5	8,240 (24.6)	
	A great deal of confidence =1	22,966 (68.6)	
	Total	33,157/33,841	
19.8 Hospitals and doctors to provide good treatment (CI8)	Hardly any confidence at all in them =0	2,602 (7.8)	203 (0.6)
	Only some confidence =0.5	9,192 (27.5)	
	A great deal of confidence =1	21,484 (64.2)	
	Total	33,278/33,481	
19.9 Courts to meet out justice (CI9)	Hardly any confidence at all in them =0	3,261 (9.7)	1,508 (4.5)
	Only some confidence =0.5	10,880 (32.5)	
	A great deal of confidence =1	17,832 (53.3)	
	Total	31,973/33,481	
19.10 Banks to keep money safe (CI10)	Hardly any confidence at all in them =0	533 (1.6)	440 (1.3)
	Only some confidence =0.5	3,070 (9.2)	
	A great deal of confidence =1	29,438 (87.9)	
	Total	33,041/33,481	



Table C.6 Descriptive Results of Spousal Communication

Variables	Categories	Frequencies (%)	Missing
16.18a Discuss farm/ work (GR18A)	Never=0	6,785 (20.3)	779 (2.3)
	Sometimes=0.5	14,109 (42.1)	
	Often=1	11,808 (35.3)	
	Total	32,702/33,481	
16.18b Discuss money (GR18B)	Never=0	3,952 (11.8)	658 (2.0)
	Sometimes=0.5	12,800 (38.2)	
	Often=1	16,071 (48.0)	
	Total	32,823/33,481	
16.18c Discuss politics (GR18C)	Never=0	11,253(33.6)	680 (2.0)
	Sometimes=0.5	15,003 (44.8)	
	Often=1	6,545 (19.6)	
	Total	32,801/33,481	

Table C.7 Descriptive Results of Autonomy

Variables	Categories	Frequencies (%)	Missing (%)
16.1 Cooking (respondent) (GR1A)	No=0	1,919 (5.7)	2 (0)
	Yes=1	31,560 (94.3)	
	Total	33,479/33,481	
16.2 Purchase (Respondent) (GR2A)	No=0	9,495 (28.4)	4 (0)
	Yes=1	23,982 (71.6)	
	Total	33,477/33,481	
16.3 N children (Respondent) (GR3A)	No=0	6,343 (18.9)	6 (0)
	Yes=1	27,132 (81.1)	
	Total	33,475/33,481	
16.4 Child ill (Respondent) (GR4A)	No=0	4,487 (13.4)	1,469 (4.4)
	Yes=1	27,525 (82.2)	
	Total	32,012/33,481	
16.5 Child's marry (Respondent) (GR5A)	No=0	6,452(19.3)	2,039 (6.1)
	Yes=1	24,990 (74.6)	
	Total	31,442/33,481	
16.6 Permission health Center (GR6A)	Yes=0	24,870 (74.3)	20 (0.1)
	No=1	8,591 (25.7)	
	Total	33,461/33,481	
16.7 Permission friend home (GR7A)	Yes=0	24,859 (74.2)	480 (1.4)
	No=1	8,142 (24.3)	
	Total	33,001/33,481	
16.22 Beat if no jewelry/ money (GR22)	Yes=0	8,662 (25.9)	136 (0.4)
	No=1	24,683 (73.7)	
	Total	33,345/33,481	
16.23 Beat if house neglects (GR23)	Yes=0	10,674 (31.9)	118 (0.4)
	No=1	22,689 (67.8)	
	Total	33,363/33,481	
16.24 Beat if bad cooking (GR24)	Yes=0	8,848 (26.4)	112 (0.3)
	No=1	24,521 (73.2)	
	Total	33,369/33,481	

Table C.7 – Continued

16.25 Beat if extramarital (GR25)	Yes=0	27,702 (82.7)	198 (0.6)
	No=1	5,581 (16.7)	
	Total	33,283/33,481	
16.31 Harassment girls (GR31)	Often=0	1,268 (3.8)	819 (2.4)
	Sometimes=0.5	4,750 (14.2)	
	Rarely=1	26,644 (79.6)	
	Total	32,662 /33,481	
17.5a Marriage choice (MH5A)	Parents or other relatives alone and Other =0	19,301 (57.6)	77 (0.2)
	Respondent and parents / other relatives together =0.5	12,430 (37.1)	
	Respondent herself=1	1,673 (5.0)	
	Total	33,404/33,481	

Table C.8 Descriptive Results of Accessibility

Variables	Categories	Frequencies (%)	Missing (%)
9.3 Health insurance (RC3)	No=0	32,402 (96.8)	68 (0.2)
	Yes=1	1,011 (3.0)	
	Total	33,413/33,481	
11.1 Medical treatment: who(QC1)	Other (traditional healer)=0	416 (1.2)	3,156 (9.4)
	Pharmacy=0.25	1,168 (3.5)	
	Pvt Dr/nurse=0.5	18,262 (54.5)	
	Govt Dr/Nurse in pvt=0.75	1,587 (4.7)	
	Govt Dr/Nurse=1	8,892 (26.6)	
	Total	30,325/33,481	
11.2 Medical treatment: where (QC2)	District town=0	3,132 (9.4)	3,208 (9.6)
	Other town=0.33	4,161 (12.4)	
	Another village/neighborhood=0.67	1	
	Village/neighborhood=1	6,083 (48.0)	
	Total	30,273/33,481	
11.6 Doctor's behavior (QC6)	Not nicely=0	243 (0.7)	3,315 (9.9)
	Somewhat nicely=0.5	7,638 (22.8)	
	Nicely=1	22,285 (66.6)	
	Total	30,166/33,481	
11.7 Medical treatment: wait time (QC7)	Above the mean (21.46)=0	9,690 (28.9)	3,555 (10.6)
	Equal and below the mean (21.46)=1	20,236 (60.4)	
	Total	29,926/33,481	

Table C.9 Descriptive Results of Composite Scores

Variable	Frequencies (%)	Mean	Std Deviation	Missing (%)
RHCapS	30,148 (90.0)	3.09	0.98	3,333 (10)
RHKnowS	29,310 (87.5)	3.03	0.92	4,171 (12.5)
RHOutS	31,030 (92.7)	2.31	0.77	2,451 (7.3)
RHWell	28,228 (84.3)	5.39	1.28	5,253 (15.7)
RHS	24,968 (74.6)	8.45	1.70	8,513 (25.4)
AutoS	30,037 (89.7)	8.13	2.26	3,444 (10.3)
AccessS	29,665 (88.6)	2.94	0.71	3,816 (11.4)
SpousalS	32,658 (97.5)	1.69	0.89	823 (2.5)
SocCapitalS	29,387 (87.8)	8.88	2.66	4,094 (12.2)

Table C.10 Skewness and Kurtosis of Composite Scores

Variables	Skewness /Std Error	Kurtosis /Std Error
RHCapS	-0.108/0.014	-0.256/0.028
RHKnowS	-0.693/0.014	-0.137/0.029
RHOutS	-1.149/0.014	1.253/0.028
RHWell	-0.331/0.015	0.132/0.029
RHS	-0.309/0.016	-0.033/0.031
AutoS	-0.545/0.014	0.094/0.028
AccessS	-0.373/0.014	-0.165/0.028
SpousalS	-0.236/0.014	-0.800/0.027
SocCapitalS	0.299/0.014	0.317/0.029

Table C.11 T Test Results of With Missing Value and With Mean Imputed

Variables	Mean (with missing)	Mean (with mean imputed)	T	P Value
RHCapS	3.09	3.09	-.382	.703
RHKnowS	3.03	2.94	-11.769	.000*
RHOutS	2.31	2.32	1.883	.060
RHWell	5.39	5.41	1.804	.071
RHS	8.45	8.35	-7.185	.000*
AutoS	8.13	8.07	-3.333	.001*
AccessS	2.94	2.94	-.121	.904
SpousalS	1.69	1.69	.227	.821
SocCapitalS	8.88	8.80	-3.710	.000*

Table C.12 Effects of Composite Variables on Reproductive Health

Variable	Effects (B)	Direct S.E.	C.R.	P Value	Indirect Effects (B)	Total Effects (B)
SpousalS → AutoS	.202 (.079)	.014	14.385	***	.000	.202 (.079)
SpousalS → AccessS	.024 (.031)	.004	5.748	***	.000	.024 (.031)
SocCapitalS → AutoS	.028 (.033)	.005	5.975	***	.000	.028 (.033)
SocCapitalS → AccessS	.011 (.041)	.001	7.551	***	.000	.011 (.041)
SpousalS → RHS	.000				.022 (.012)	.022 (.012)
SocCapitalS → RHS	.000				.004 (.007)	.004 (.007)
Region → RHS	.285 (.080)	.018	16.169	***	.000	.285 (.080)
Income2 → RHS	.001 (.007)	.001	1.395	.163	.000	.001 (.007)
Education → RHS	.137 (.390)	.002	78.774	***	.000	.137 (.390)
AutoS → RHS	.087 (.118)	.004	23.866	***	.000	.087 (.118)
AccessS → RHS	.181 (.073)	.012	14.781	***	.000	.181 (.073)

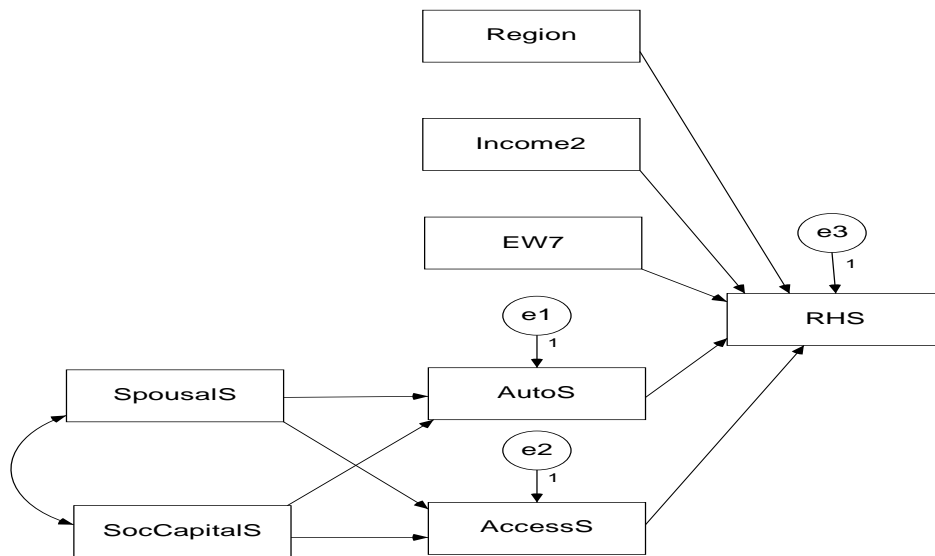


Figure C.1 Composite Model

Table C.13 CFA Results

Variable	Effects	Correlations	P Value
RHS1 → RHCapS	1.000	.027	
RHS1 → RHKnowS	.942	.165	***
RHS1 → RHOutS	.304	.182	***

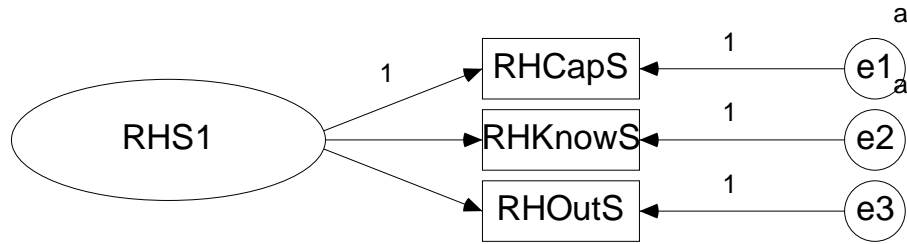


Figure C.2 CFA Model

Table C.14 Effects of Independent Variables on Reproductive Health

Variable	Effects (B)	Direct S.E.	C.R.	P Value	Indirect Effects (B)
SpousalS → AutoS	.202 (.079)	.014	14.385	***	0
SpousalS → AccessS	.024 (.031)	.004	5.748	***	0
SocCapitalS → AutoS	.028 (.033)	.005	5.975	***	0
SocCapitalS → AccessS	.011 (.041)	.001	7.551	***	0
SpousalS → RHS1	0				.008 (.030)
SocCapitalS → RHS1	0				.001 (.017)
Region → RHS1	.105 (.224)	.006	18.956	***	0
Income2 → RHS1	.001 (.030)	.000	2.720	.007*	0
Education → RHS1	.042 (.906)	.001	42.513	***	0
AutoS → RHS1	.031 (.313)	.001	24.806	***	0
AccessS → RHS1	.056 (.172)	.004	14.985	***	0

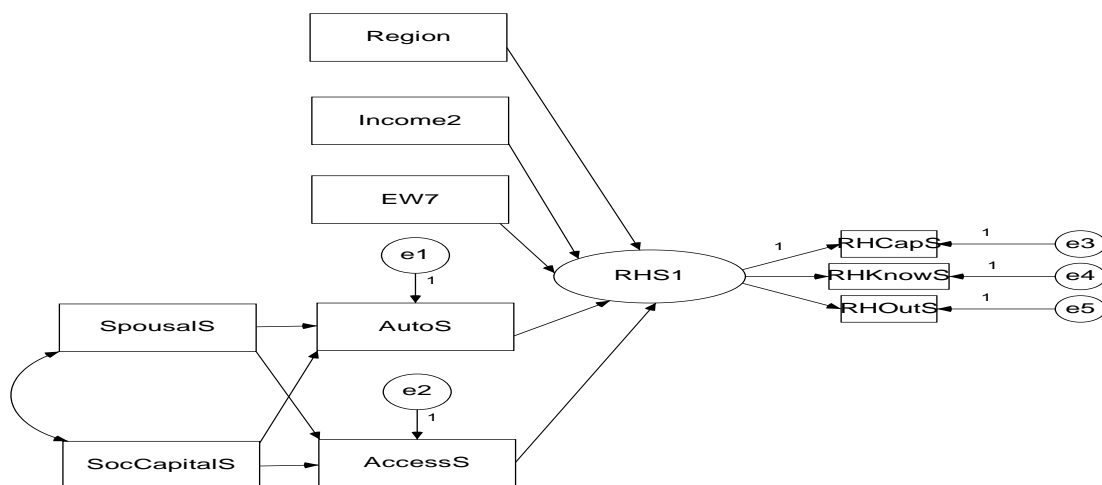


Figure C.3 SEM Model

Table C.15 Multinomial Regression Results:

Low Level of Reproductive Health versus Middle Low Level of Reproductive Health

	B	S.E.	Wald	df	Sign.	Exp (B)
Region3	.181	.071	6.517	1	.011	1.198
Income 32	.001	.059	.000	1	.987	1.001
Income 33	.209	.077	7.409	1	.006	1.232
Edu22	.367	.064	32.610	1	.000	1.443
Edu23	.869	.108	64.396	1	.000	2.384
AutoS22	.206	.060	11.882	1	.001	1.228
AutoS23	.666	.070	89.869	1	.000	1.946
AccessS22	.140	.061	5.313	1	.021	1.150
Access23	.171	.066	6.794	1	.009	1.186

Table C.16 Multinomial Regression Results:

Low Level of Reproductive Health versus Middle Level of Reproductive Health

	B	S.E.	Wald	df	Sign.	Exp (B)
Region3	.417	.069	36.790	1	.000	1.517
Income 32	-.045	.059	.602	1	.438	.956
Income 33	.276	.075	13.537	1	.000	1.318
Edu22	.739	.062	140.362	1	.000	2.095
Edu23	1.827	.105	302.774	1	.000	6.214
AutoS22	.399	.058	46.727	1	.000	1.490
AutoS23	.966	.069	196.514	1	.000	2.627
AccessS22	.267	.060	19.972	1	.000	1.306
Access23	.428	.064	44.681	1	.000	1.535

Table C.17 Multinomial Regression Results:

Low Level of Reproductive Health versus High Level of Reproductive Health

	B	S.E.	Wald	df	Sign.	Exp (B)
Region3	.529	.075	49.832	1	.000	1.697
Income 32	.019	.067	.084	1	.772	1.020
Income 33	.280	.084	11.233	1	.001	1.324
Edu22	1.260	.068	346.614	1	.000	3.525
Edu23	3.167	.108	865.292	1	.000	23.725
AutoS22	.451	.067	45.090	1	.000	1.570
AutoS23	1.054	.076	189.712	1	.000	2.868
AccessS22	.239	.069	12.009	1	.001	1.270
Access23	.443	.073	37.028	1	.000	1.557

Table C.18 Status of Empirical Support for the Proposed Hypotheses

Hypotheses	Composite Model	SEM	Multinomial Regression
Women's income has a significant positive effect on women's reproductive health.	Not supported	Supported	Partially supported
Women's educational level has a significant positive effect on their reproductive health.	Supported	Supported	Supported
Social capital has a significant positive effect on women's autonomy.	Supported	Supported	Supported
Social capital has a significant positive effect on women's ability to access resources.	Supported	Supported	Supported
Spousal communication has a significant positive effect on women's autonomy.	Supported	Supported	Supported
Spousal communication has a significant positive effect on women's ability to access resources.	Supported	Supported	Supported
Women's autonomy has a significant positive effect on women's reproductive health.	Supported	Supported	Supported
Women's ability to access resources has a significant positive effect on women's reproductive health.	Supported	Supported	Supported



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