UNMET NEED FOR CONTRACEPTION IN MONGOLIA

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ABSTRACT

This study aimed to investigate the determinants of unmet need for contraception in Mongolia which would help address major issues of the national family planning program. Data for this study came from the Multiple Indicator Cluster Survey 2010 in Mongolia. 5,781 currently married or in union women aged 15-49 years were analyzed. This study examined the determinants of unmet need for contraception employing a binary logistic regression model. The analysis of determinants was further broken down into two models based on the concept of unmet need for contraception, spacing and limiting the number of children.

In total, unmet need for contraception among currently married or in union women aged 15-49 years was 21 percent in Mongolia in 2010. Of this total unmet need for contraception, one-fourth was for spacing and three-fourth was for limiting. Due to this composition, the pattern of total unmet need for contraception for limiting was similar to overall pattern of total unmet need for contraception. This study revealed that place of residence, knowledge of contraception, women's age, income, number of living children, and ethnicity significantly determined unmet need for contraception. To promote healthy family planning, the program should focus on women who live in urban areas and enhance contraception knowledge.

KEY WORDS: FAMILY PLANNING / UNMET NEED FOR CONTRACEPTION / LIMITING / SPACING / MONGOLIA

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LIST OF ABBREVIATIONS

CEB	Children ever born
CBR	Crude birth rate
DHS	Demographic and Health Survey
ICPD	International Conference on Population and Development
MICS	Multiple Indicator Cluster Survey
NSO	National Statistical Office
PSU	Primary sampling unit
RHS	Reproductive Health Survey
SE	Standard error
UN	United Nations
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development

CHAPTER I
INTRODUCTION

1.1. Rational

Family planning is one of the very important issues of sexual and reproductive health and rights. All reproductive age people have a right to decide how many children they have and when to have children. And appropriate family planning should effectively prevent too early or too late pregnancies or regulate the period between births which is important to the health of women and children (NSO Mongolia & UNICEF, 2013).

Unmet need for contraception, defined as women aged 15-49 years who do not want to be pregnant but who are not using contraception, is very important concept for family planning programs and policies.

Globally, around 222 million women want to delay or prevent pregnancy, but they are not using effective or modern methods of contraception (Singh & Darroch, 2012). Unmet need for contraception makes different consequences in different level, family, community, and economy (Knerr, 2012). It causes thousands of unintended pregnancies, ill health, maternal death and leads unsafe abortion (Ashford, 2003). Also it contributes to drop out of school among young girl due to unplanned pregnancies and increases poverty (Knerr, 2012).

Since 1989 when abortion became legal in Mongolia, abortion rate is increased significantly. Last year, abortion rate is 250 per 1000 live births as information of National Statistical Office of Mongolia. In other word, one fifth of total pregnancies were terminated by abortion. This situation addressed needs of in-depth research and comprehensive family planning program.

As a result of Multiple Indicator Cluster Survey (MICS), knowledge of contraception is remaining high over 98 percent among reproductive age women who are married or in union (Figure 1.1). However contraception prevalence rate (CPR) is decreasing slowly and unmet need for contraception is increasing. It shows

knowledge, attitudes and practices (KAP) gap which lead to research gap on why there is high difference between knowledge and behavior and why CPR decreases and unmet need for contraception increases despite the existence of many programs.

As a shown in Figure 1.1, every one fifth (22 percent) women who are currently married or in union has unmet need for contraception in 2010 and it increased by 8 percent compared with 2005 in Mongolia.

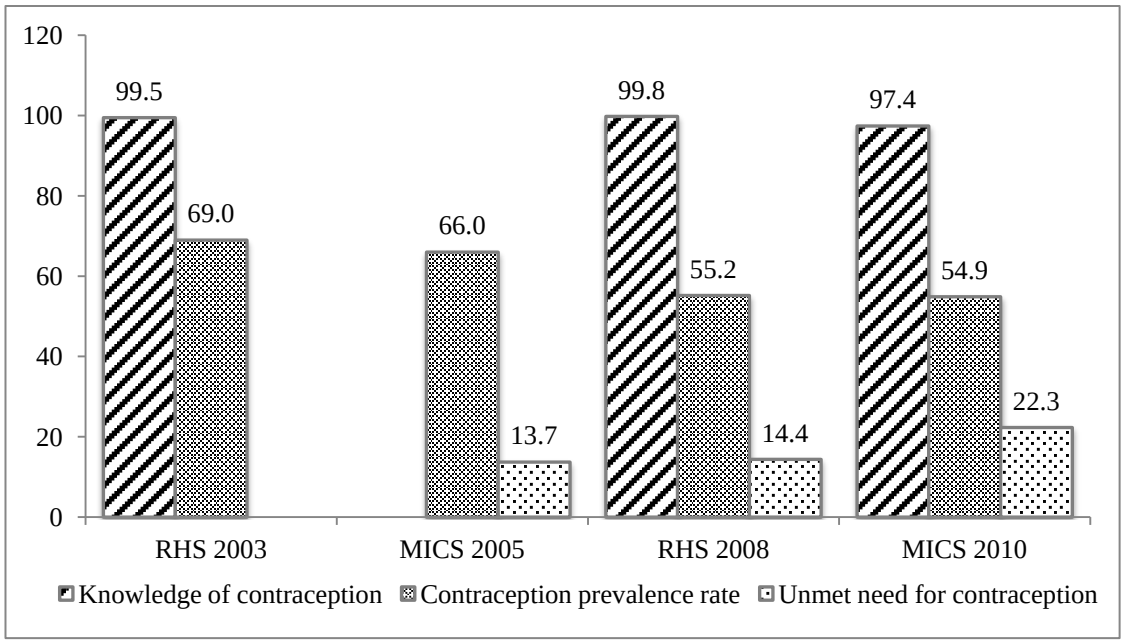

Figure 1.1: Knowledge of contraception, contraception prevalence rate and unmet need for contraception, MICS 2005, 2010, RHS 2003, 2008

Source: National Statistical Office of Mongolia, MICS and RHS

1.2. Justification

As mentioned earlier, unmet need for contraception is one of important concepts of family planning policies and programs. If we study women who do not want any more children or want to postpone pregnancy but they are not using any contraception methods, we could characterize women who have unmet need for contraception. It is useful to define target group of family planning program and provide reproductive right to those women.

Mongolia has some survey findings related to unmet need for contraception, but has limited in-depth research. Thus, this study try to investigate which factors affect unmet need for contraception and fill lack of in-depth research related to unmet need for contraception.

1.3. Country context

Mongolia is developing country located in East and Central Asia between Russia and China. Total population is 2.8 million as a Population and Housing Census 2010. Major ethnicity is Khalkh which was accounted more than 80 percent of national population. Mongolia shifted to democracy from socialism and parallelly started transition to the market economy from centrally planned economy since 1989.

Before 1989, Mongolia has a pro-natal policy. Thus, some provisions aimed to increase fertility were implemented. For example, award mother with many children would be awarded for Mother's Honour medal. Maternity leave was granted before and after delivery for mothers. More over extra taxes was offered for people who did not have any children. That time, choice of contraception was limited and only intrauterine device (IUD) was available. Therewith use of IUD was also limited and given women who have some health problem based on the decision of medical committees. Also, abortion is illegal. The exception was just allowed for mother and child's health indicators. In the early 1990s, knowledge and use of contraception are very low at about 10 percent among reproductive age women (UNFPA Mongolia, 2009).

Mongolian Parliament adopted and amended many laws, acts and regulations ceasing pro-natal policy since 1989. For example, Health Protection Law accepted women's right to decide whether to have a child or not in 1989 while abortion is legalized as well. In Mongolia, the Maternal and Child Health, and Family Planning Project implemented with assistance from UNFPA since 1992. This project made contribution to advocacy of reproductive health and rights including family planning understanding. As commitment of ICPD, many projects were implemented to enhance understanding and knowledge about reproductive health and rights (UNFPA Mongolia, 2009).

During the economic transition period, many household avoided big family size due to encountering the economic crises. Because of that, number of birth was declining sharply during mid 1990s and was staying around 50,000 until 2006 (Figure 1.2). Since 2006, number of birth is increasing due to socio-economic situation, government policy and belief among people. The Government of Mongolia started to give "Child allowance" to the all children under age 18 during 2006-2010. The golden pig year, 2007, is the symbol of luck and prosperity. Child borned in 2007 were believed to be lucky and have good life. Furthermore, "Child who was born in mouse/rat year, 2008, has one's share of happiness or food luck". So maybe, this belief made an increase of birth.

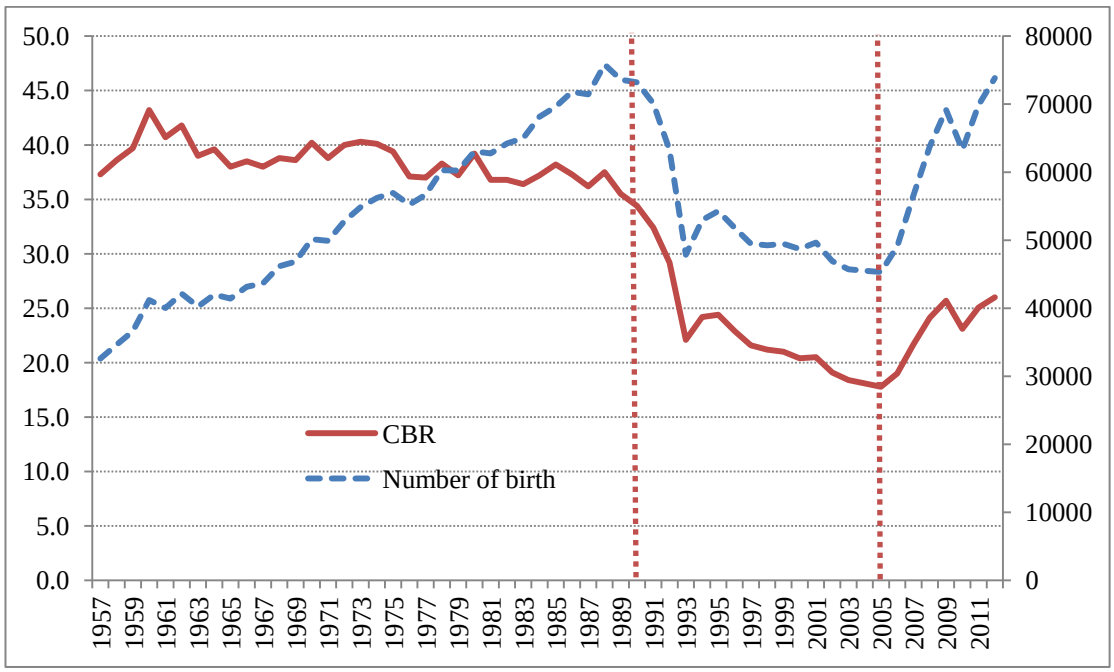

Figure 1.2: Number of birth and crude birth rate, Mongolia, 1957-2012

Source: National Statistical Office of Mongolia, Administrative data, www.1212.mn

People choose abortion as the way to terminates unwanted pregnancy. Thus, abortion is one of consequences of unmet need for contraception. As mentioned earlier, abortion became legal in Mongolia in 1989. After 1989, abortion rate increased significantly and reached at 445 per 1000 live births at beginning of 1990s (Figure 1.3). Many interventions were implemented, to ensure sustainable supply system of contraception and introduce post-abortion counseling conducted to make safe abortion.

Even though abortion rate is still high, it is fluctuating from 168 to 280 per 1000 live births since 1998.

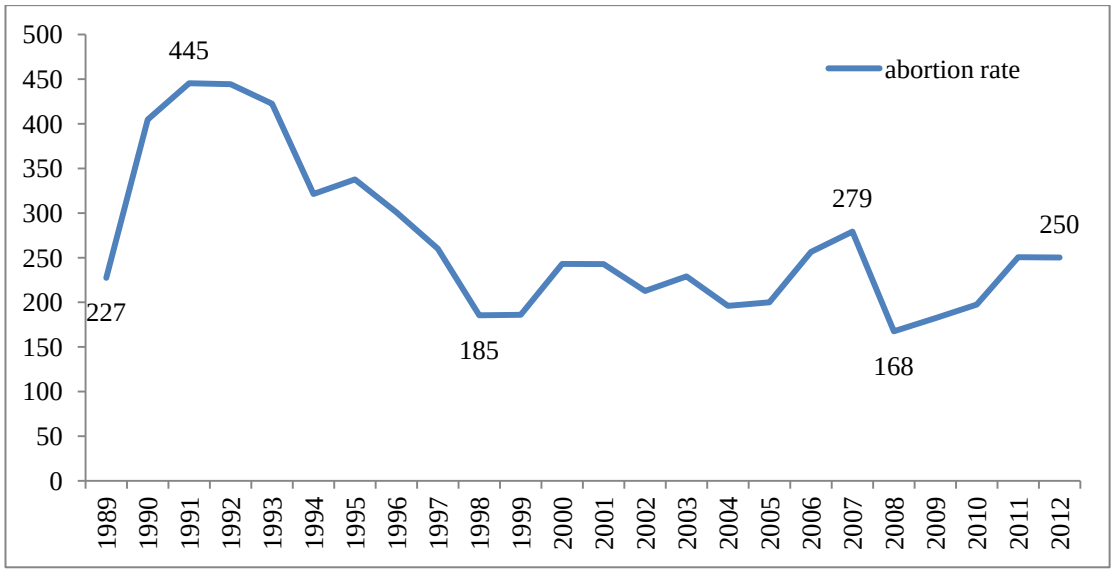

Figure 1.3: Abortion rate per 1000 live births, Mongolia, 1989-2012

Source: National Statistical Office of Mongolia, Administrative data

1.4. Research question

This study based on two research questions.

1. What are the significant determinants of unmet need for contraception in Mongolia in 2010?
2. Is there any different characteristics between women who have unmet need for contraception for limiting and spacing?

1.5. Research objectives

The ultimate objective of this study is to suggest recommendations to policy makers and family planning programs based on the findings on determinants of unmet need for contraception in Mongolia.

Immediate objectives of this study are:

1. To examine determinants of unmet need for contraception.

2. To determine and compare characteristics of unmet need for contraception for limiting and spacing.

CHAPTER II
LITERATURE REVIEW

2.1. General definition of unmet need for contraception

Definition of unmet need for contraception was initiated around 1960s when researchers found that some women's reproductive intentions and use of contraception are varied. There are many definition of unmet need for contraception that has been developed (Bradley, Croft, Fishel, & Westoff, 2012).

As preceding, general definition of unmet need for contraception relates to women who want to postpone (spacing) or to avoid (limiting) pregnancy but are not practicing contraception. However, calculation of unmet need is very complicated.

Firstly, researchers calculated proportion of women who want no more children but did not use contraception, termed as, unmet need for limiting, based on the dataset of World Fertility survey due to data availability (Bongaarts, 1991). Westoff and Pebley (1981) recommended that definition and calculation of unmet need for contraception would be developed and included concept of unmet need for spacing and mentioned that some women who is not currently married or in union need family planning for regulating their birth.

Unmet need for contraception has been calculated with using different definition and calculation from different sources. For instance, Demographic and health survey (DHS) developed by Macro international with funded by USAID and Multiple indicator cluster survey (MICS) developed by UNICEF, used different definition with different questions. In 2012, calculation of unmet need for contraception that used to DHS was revised in order to make enable the definition to be consistently applied to all DHS surveys, would be simpler to understand and implement than the Original definition, and could be calculated using data from MICS and other surveys (Bradley et al., 2012). Now revised definition of unmet need for contraception used to DHS and definition of unmet need for contraception used to

MICS are quite similar except one question which about ever use of contraception. This question already added in next round MICS.

This study used MICS definition of unmet need for contraception. MICS definition defined unmet need for contraception as the percentage of women who are currently married or in union and are fecund and not using a method of contraception.

For spacing: Women who are not using a method of contraception and

1. are not pregnant and not postpartum amenorrheic and say they want to wait two or more years for their next birth or unsure whether they want another child or
2. are pregnant or postpartum amenorrheic and say that pregnancy was mistimed: would have wanted to wait;

For limiting: Women who are not using a method of contraception and

1. are not pregnant and not postpartum amenorrheic and say they do not want any more children or
2. are pregnant or postpartum amenorrheic and say they did not want to have a child/ birth (NSO Mongolia & UNICEF, 2013).

2.2. Determinant variables of unmet need for contraception

Generally, use of contraception increases and fertility rate decreases, but unmet need for contraception does not decline constantly like fertility (Ashford, 2003). Unmet need for contraception was higher for limiting than spacing in all regions except Sub-Saharan Africa (World Bank, 2010).

Investigating who have unmet need for contraception would be very useful for policy makers and program officers in order to develop appropriate interventions. Thus, defining determinants of unmet need for contraception is very important part of this study.

2.2.1. Women's age

Generally, unmet need for contraception increases with age at least until age 35-39 years, and tend decreases in later stage of ages (Westoff & Pebley, 1981). The unmet need for spacing is higher among younger ages and decline with increasing age, but the unmet need for limiting is the opposite direction (DeGraff & Silva, 1991).

2.2.2. Women's education

Women who have lower education more likely to have unmet need for contraception due to the smaller likelihood to exposed to family planning messages on radio or TV (Ashford, 2003). Westoff and Pebley (1981) founded that there were large difference of unmet need for contraception between women who have no education and highly educated. This research also found the pattern of unmet need for contraception among different educational level that unmet need for contraception increases with higher education.

2.2.3. Number of living children

Number of desired children has significant relationship with unmet need for contraception (World Bank, 2010). The percentage of unmet need for limiting is increased among women who have more than four children. But unmet need for spacing declines after three children (Kalerat, 2004). Westoff and Pebley (1981) founded that unmet need for contraception increases with the number of children.

2.2.4. Satisfaction with marriage

There are no studies that examine relationship between unmet need for contraception and marriage satisfaction. The subjective perceptions of individuals of their marriage, incomes, friendship and living environments has a significant influence in their lives and can impact their perception of well-being (NSO Mongolia & UNICEF, 2013). As we know that most people suppose that women who satisfied with her current marriage are less likely to have unmet need for contraception compared with women who do not satisfied with her current marriage due to marriage satisfaction affect to the their desired number of children. Thus, this study tries to

reveal that relationship between unmet need for contraception and satisfaction with marriage.

2.2.5. Income

This study used to variable, whether woman have income or not, as proxy indicator of woman's work. MICS 2010 did not have questions related woman's work status. Several studies reveal significant relationship between work status and unmet need for contraception. Women who currently work are less likely to have unmet need for contraception especially for limiting (Okajaa, 2008) and more likely to use contraception (Sharma, KC, & Ghimire, 2011).

2.2.6. Place of residence

Generally, unmet need for contraception is higher in rural area than in urban area due to some social-economic factors and availability of service access. However, women who live in slum area of cities are more likely to have greater unmet need for contraception than elsewhere. Women who live in urban areas are somewhat less likely to have an unmet need for contraception than those live in rural areas (Westoff & Pebley, 1981).

2.2.7. Ethnicity

Several studies reveal that use of contraception and unmet need for contraception differ by ethnic group in some countries. For example, in Bolivia, there is ethnicity differential in unwanted fertility (McNamee, 2008); in Nepal, ethnicity as individual level factor significantly affect to contraceptive use (Sharma et al., 2011); and in Ethiopia, ethnicity has significant relationship with unmet need for contraception (Korra, 2002).

2.2.8. Religion

Some studies found that religion significantly affect to use of contraception. In other word, respect their religion or their partner's religion are significant influence for unmet need for contraception (Kafuko, 2010), especially among Muslim (Firmanto & Utomo; Kafuko, 2010) and Catholic (Kafuko, 2010)

women. Also one research found that religion affects to the desired number of children. Muslim women are more likely to have a larger number of desired children than non-Muslim women (Firmanto & Utomo). Because Muslim countries generally have experienced high fertility rates due to they believe that the number of children they will have is God's will.

2.2.9. Wealth quintiles

Pattern of relationship of unmet need for contraception and household wealth quintiles is different by country to country due to the declining of different stages of fertility. In countries with the earlier declining stages of fertility, unmet need for contraception increases with wealth. Whereas, in countries which at the pre-transition and late transition declining stages of fertility, unmet need for contraception might be no differences for all wealth quintile (World Bank, 2010).

2.2.10. Knowledge of contraception

Many studies revealed that there is a relationship between unmet need for contraception and knowledge of contraception. Korra (2002) found that women who have knowledge about family planning are 1.5 times less likely to have unmet need for contraception for spacing, 4 percent more likely to have unmet need for limiting compared with women who have not knowledge about family planning. Hailemarian and Haddis (2011) found that unmet need for contraception among women who know at least one method of contraception was higher than among women who do not know any method in Ethiopia.

2.2.11. Exposure to mass media

Exposure to mass media is one of program variables, which shows effectiveness of advocacy among population through television, radio and newspaper. Exposure to mass media is somewhat related to education and place of residence since mass media includes newspaper.

Some studies revealed that exposure to family planning messages through mass media is significantly related to unmet need for contraception. For examples, Okajaa (2008) found that women who expose to family planning message through

mass media were less likely to have unmet need for contraception in Kenya and Korra (2002) found that women who exposure mass media were 80 percent less likely to have an unmet need for spacing in Ethiopia.

2.3. Conceptual framework

From literature review, many researches shown that individual and household characteristic and some program factors affect an unmet need for contraception.

This study investigated significant determinants of unmet need for contraception in Mongolia using MICS 2010 dataset. This study examined women's age, education, income, number of live birth and marriage satisfaction from individual factors; place of residence, ethnicity and religion of household head and wealth quintiles from household factors and knowledge of contraception and exposure to mass media from program factors (Figure 2.1).

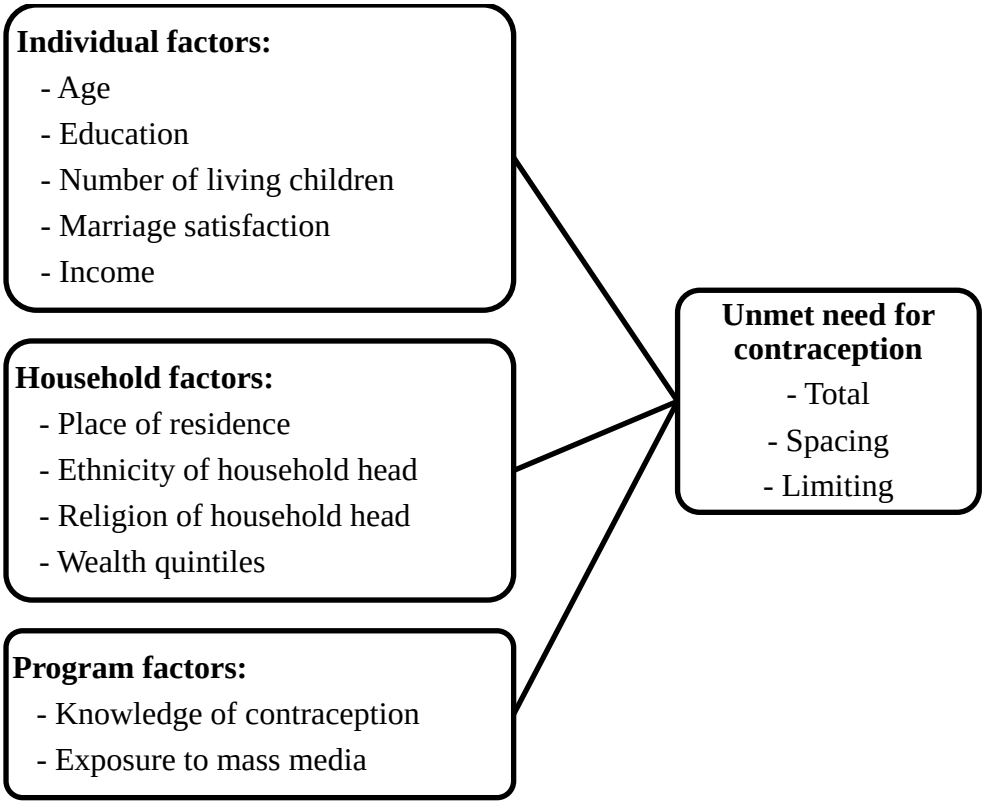

Figure 2.1: Conceptual framework

CHAPTER III
RESEARCH METHODOLOGY

3.1. Source of data

This study uses secondary data that derived from Multiple Indicator Cluster Survey (MICS) 2010 supported by Government of Mongolia and UNICEF. MICS is the standard survey which was developed and provided technical assistance for all stages of survey by UNICEF. National Statistical Office of Mongolia conducts MICS every five years according to the Law on Statistics of Mongolia.

The objective of MICS is to gather and analyze data needed for monitoring and evaluating the situation of children, and women through including some specific area such as health, education, development and protection (NSO & UNICEF, 2013). This survey is a household based sample survey that represents national, regional and area (urban, rural) level. MICS 2010 had 5 separated questionnaires: household, women, men, children under 5 and children aged 2-14 years.

3.2. Sampling design

As mentioned previously, MICS is household based survey. Thus, household based survey's sampling size calculation equation was used for MICS 2010 indicating below. A key indicator of sample calculation was pre-school attendance rate among children aged 3-4 years. Total sample of MICS 2010 was 10,500 households.

$$n = \frac{4r(1-r)(deff)(1.1)}{(.12r)^2(p)(\bar{n})} = \frac{4r(1-r)(deff)(1.1)}{(RME)^2(r)^2(p)(\bar{n})}$$

where is:

- *n* is the required sample size, expressed as number of households
- *4* is a factor to achieve the 95 percent level of confidence
- *r* is the predicted or anticipated value of the key indicator, expressed in the form of a proportion

- *1.1* is the factor necessary to raise the sample size by 10 percent for the expected non-response
- *deff* is the shortened symbol for design effect, in other hand, the ratio of the variance of the estimator based on the complex design to the variance of the estimator based on simple random sampling of the same size.
- *0.20r* is the margin of error to be tolerated at the 95 percent level of confidence, defined as 20 percent of r (relative margin of error of r) at the regional level
- *p* is the proportion of the total population upon which the indicator, r, is based
- is the average household size (number of persons per household).

Two stage sampling method was used for sampling design in MICS 2010. Firstly, primary sampling units (PSU) were selected systematically with probability proportional to population size. PSU was bagh in province level or kheseg in capital city level those are the lowest administrative units in Mongolia. After defining total 420 PSUs, 25 households were selected using systematic sampling from each selected PSU.

Figure 3.1 shows selection of sampling cases for analysis in this study. 9,599 women aged 15-49 years were listed in the interviewed households' questionnaire in MICS 2010. Of these listed reproductive age women, 8,762 were completely interviewed. Of these, 5,872 women were identified as currently married or in union. Calculation of unmet need for contraception is based on women who are currently married or in union. There was exclusion of 91 cases since those cases had missing with satisfaction with marriage, income and ethnicity and religion of household head. Finally, 5,781 units' information (women who are currently married or in union) used for analysis of this study.

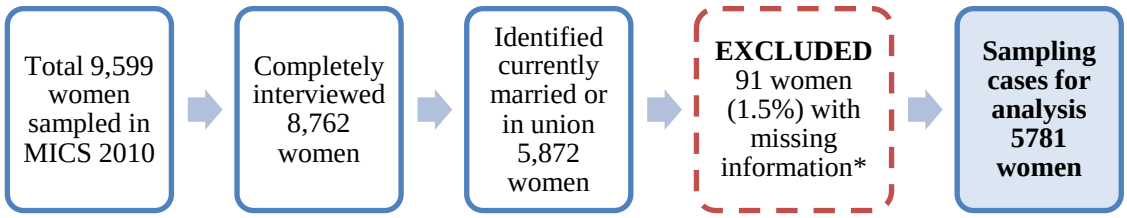

Figure 3.1: Select sampling case for analysis flow

** Satisfaction with marriage and income, and ethnicity and religion of household head*

3.3. Method of data analysis

This study used descriptive statistics and binary logistic regression analysis. Descriptive statistics was used for defining general differentials of unmet need for contraception by selected characteristics. Binary logistic regression was employed for examining which factor statistically relate with unmet need for contraception. This study employed three binary logistic regression models for total unmet need as well as for limiting and for spacing. Also, adjusted probabilities were calculated. All results including descriptive statistics and binary logistic regression were not weighted.

In this study, STATA and SPSS package statistical software program was used for analysis.

3.4. Operational definition

All variables used for this study were defined in this part. In the Table 3.1 covered brief definition, value label and scale of measurement of all variables.

Table 3.1: Operational definition of dependent and independent variables

Variables	Value label	Scale of measurement	Remarks
Dependent variable			
Unmet need for contraception - Total - Limiting - Spacing	0. No 1. Yes	Nominal scale	By purpose, unmet need for contraception divides two categories: for limiting and for spacing. Total unmet need for contraception was calculated as sum of limiting and spacing. These three variables (total, limiting and spacing) have dichotomous responses.
Independent variables			
Women's age	Women's age ranges 15-49 years.	Ratio scale	Women's age defined as completed age based date of birth at the date of interview.
Women's education level	0. Less than tertiary 1. Tertiary	Nominal scale	
Number of living children - 0 - 1-2 - 3+	0. No 1. Yes	Ordinal scale	Using dummy variable.
Satisfaction with marriage	0. Unsatisfied 1. Satisfied	Nominal scale	Satisfaction with marriage defined as whether woman is very or somewhat satisfied with her marriage or not.

Table 3.1: Operational definition of dependent and independent variables (cont.)

Income	0. No income 1. Having income	Nominal scale	Income defined as whether woman has income or not. This variable was computed from satisfaction question with income. This question had six different responses: no income and rest of responses related satisfaction. From this, dichotomous responses variable was recoded have no income to "no income", rest of responses to "having income".
Place of residence	0. Rural 1. Province center 2. Capital city	Nominal scale	Capital city and province center are recognized as urban. Soum (sub-province) center and countryside are recognized as rural.
Ethnicity of household head	0. Khalkh 1. Other	Nominal scale	Ethnicity of household head defined as whether head of household woman lives in khalkh. MICS 2010 did not ask ethnicity question from individual women. Thus, it is kind of proxy variable.
Religion of household head	0. No religion 1. Has a religion	Nominal scale	Religion of household head defined as whether household head has a religion. MICS 2010 did not ask religion question from individual women. Thus, it is also kind of proxy variable.

Table 3.1: Operational definition of dependent and independent variables (cont.)

Household wealth quintiles	0. Poorest 1. Second 2. Middle 3. Fourth 4. Richest	Ordinal scale	Wealth quintiles calculated based on wealth index that is estimated for each of interviewed household using the information such as source of drinking water, type of sanitary facility, housing type and materials, availability of electricity, household assets applying Principal Component Analysis technique.
Knowledge of contraception	Number of contraception method woman knows ranges 0-13.	Ratio scale	Knowledge of contraception defined as number of contraception method woman knows.
Exposure to mass media	0. Not exposure to mass media 1. Exposure to mass media	Nominal scale	Exposure to mass media defined as reading a newspaper or magazine, listening to the radio and watching television at least once a week.

3.5. Limitation

As mentioned earlier, this study used MICS 2010 definition but it is little bit different from revised definition of unmet need for contraception due to not including one question about “ever use of contraception”. Also, some useful variables were excluded such as reason of not using contraception, decision making for use contraception and working status etc.

3.6. Ethical issue

In data collection field of MICS 2010, interviewers explained objective of survey and informed how to protect individual information to all respondents and asked consent from them prior to the interview.

Letter of consent for use MICS 2010 dataset in this study was took from National Statistical Office of Mongolia. IPSR Institutional Review Board gave Certificate of Approval (COA. No. 2013/1-1-15).

CHAPTER IV
RESEARCH FINDING

This chapter has two parts: descriptive analysis and multivariate analysis. First part, descriptive analysis, provides demographic and socio-economic characteristics of women who have unmet need for contraception. Second part, multivariate analysis, introduces the result of investigation of significant determinants affecting unmet need for contraception.

4.1. Descriptive statistics

As mentioned in chapter 3, 5,781 married or in union women aged 15-49 years were analyzed. Figure 4.1 shows percentage of married or in union women aged 15-49 years by met and unmet need for contraception status. As figure shown, 43.2 percent of married women were not using contraception while 56.8 percent was using contraception in Mongolia in 2010. Of women who did not use contraception, 14.2 percent is pregnant women, 13.6 percent is postpartum amenorrheic women, 58.6 percent is other fecund women, and 13.5 percent is infecund women. Following the definition of unmet need for contraception, 5.7 percent of pregnancy was mistimed, unmet need for spacing, and 3.2 percent pregnancy was unwanted, unmet need for limiting. 17.6 percent of fecund women who did not use contraception want a child after 2 years later or referred to unmet need for spacing, while 61.1 percent of fecund women who did not use contraception did not want more children at all or referred to unmet need for limiting as definition of unmet need for contraception.

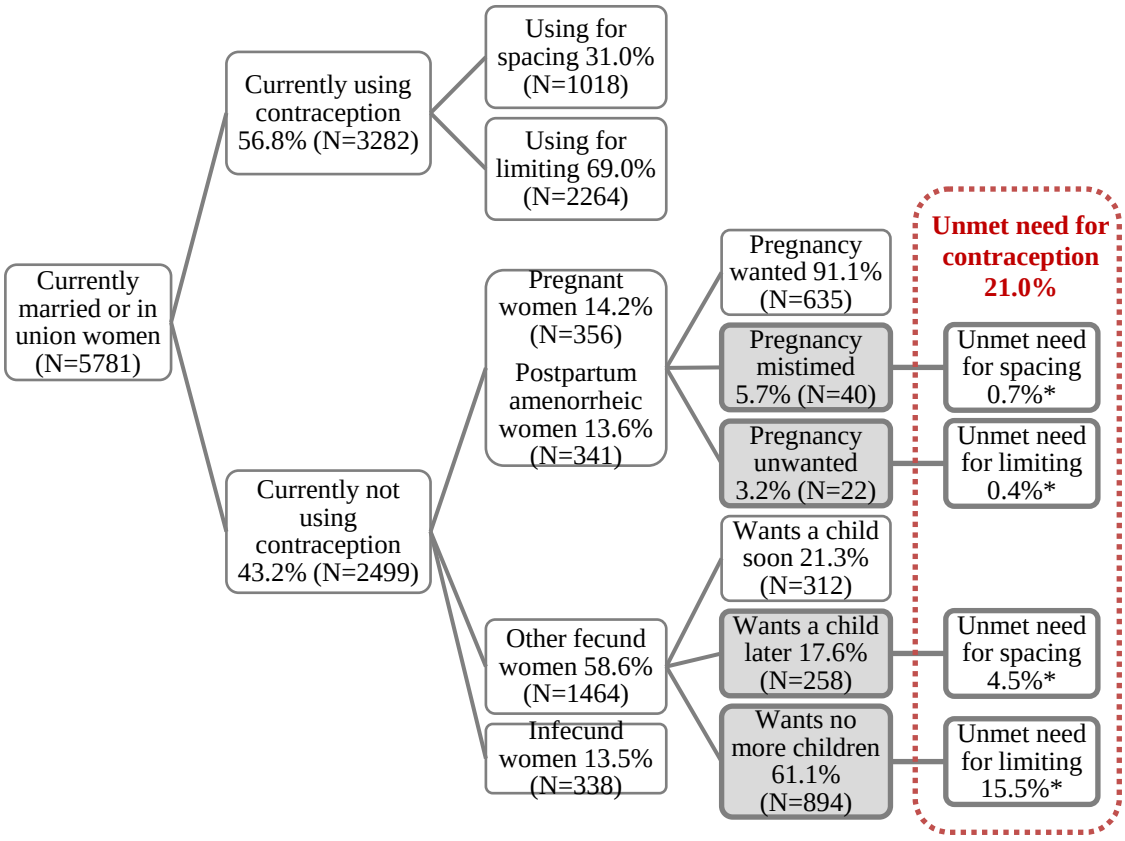

Figure 4.1: Met and unmet need for contraception, Mongolia, 2010

*Note: * Denominator of these percentages is currently married or in union women aged 15-49 years (N=5781)*

In total, 21.0 percent of currently married or in union women aged 15-49 years have unmet need for contraception. Unmet need for contraception for limiting (15.9 percent) was three times higher than for spacing (5.2 percent). Figure 4.2 shows total unmet need for contraception and its composition by spacing and limiting in Mongolia and regions. As shown Figure 4.2, total unmet need for contraception in Mongolia is higher than Middle East/ North Africa (12.3 percent), Eastern Europe (13.1 percent) and Latin America and Caribbean (18.6 percent) region but lower than African region (26.2-27.0 percent). Compared with Asia region, total unmet need for contraception is similar, but composition of total unmet need is quite different in Mongolia. Composition of unmet need for contraception in Mongolia is similar to Eastern Europe region, which unmet need for limiting is around 75 percent while unmet need for spacing is 25 percent. In other word, three in fourth women who have

unmet need for contraception want to stop their childbearing and one in fourth women want to postpone pregnancy by more than 2 years.

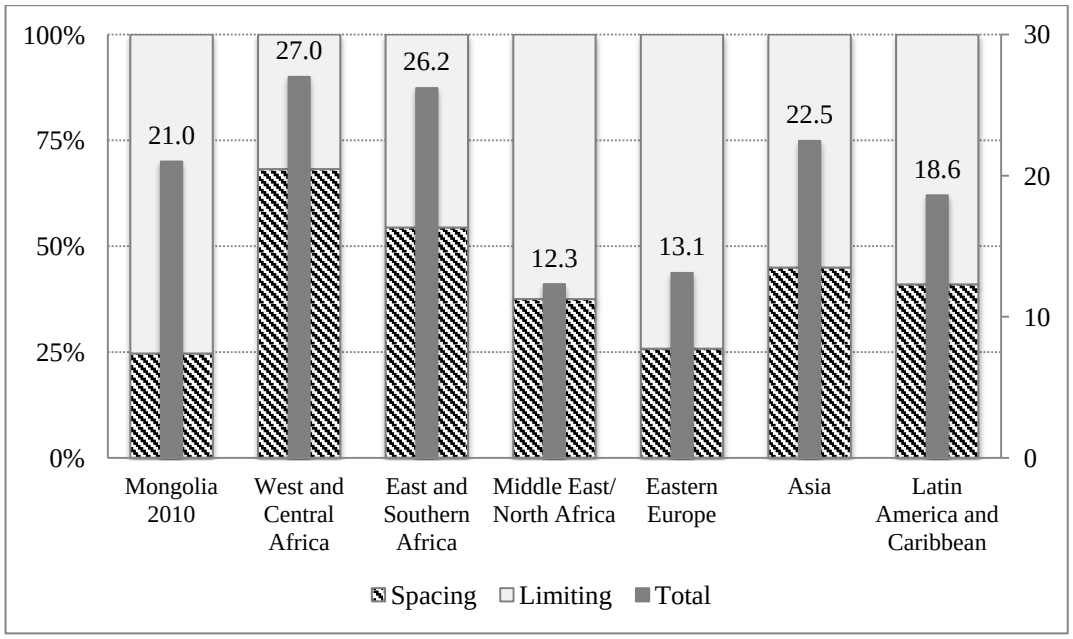

Figure 4.2: Composition of total unmet need for contraception by purpose, in Mongolia and other regions

Source: USAID, Analytical study on DHS

Note: The results from most recent DHS (2000-2010) survey from 58 countries were not weighted by the population of each country. Each country represents one observation. All averages are simple arithmetic means.

Table 4.1 shows percentage of distribution of married or in union women by selected demographic and social-economic characteristics according to unmet need for contraception status. In general, pattern of unmet need for contraception for limiting almost fits into overall pattern of total unmet need for contraception since one fourth of total unmet need for contraception was for limiting. An average child ever born (CEB) was 2.7.

By age group, total unmet need for contraception was increasing with age group. This trend was same to unmet need for limiting, but was reverse to unmet need for spacing. Unmet need for contraception for spacing was the highest among women

aged 15-24 years (11.6 percent vs. 0.7-6.4 percent) while for limiting was the highest among women aged 40-49 years (30.1 percent vs. 4.6-10.0 percent).

There is not much difference in total unmet need for contraception by women's education level. However, finding shows difference in unmet need for contraception for spacing and limiting by education. Women who have tertiary education (6.6 percent) had more unmet need for contraception for spacing than women who have less than tertiary education (4.5 percent). This pattern was contrary to unmet need for limiting.

Table 4.1 shows that satisfaction with marriage is important for family planning. For example, women who satisfy with her marriage were at less desire to regulate their pregnancy than those who do not satisfy with her marriage. As shown in Table 4.1, there was no difference in unmet need for contraception among women who expose to mass media and not expose to mass media.

Women who have income were more likely to have unmet need for contraception (22.4 percent) than who do not have income (18.1 percent). It may relate to opportunity cost. As we knew, in terms of household wealth, many wealthier household try to reduce number of desired children. Also many studies, in terms of women's job, found that women who have a job are more likely to have unmet need for contraception.

By place of residence, the unmet need for contraception for both of limiting and spacing were high in urban areas, especially in capital city, although children ever born was lower (2.4 in province center and 2.1 in capital city) than rural areas (3.0). For example, the unmet need for contraception for spacing in capital city was 6.9 percent, which was 1.7 times higher than in rural areas, and the unmet need for contraception for limiting in capital city was 18.1 percent, which was 1.4 percent point higher than in province center and 3.4 percent point higher than in rural areas. This is contrary to general trend of unmet need for contraception in the world. This may happen due to urbanization and increasing women's education level in urban areas. Mongolia is facing rural-urban migration and its problem nowadays.

Table 4.1. Unmet need for contraception status and children ever born by selected demographic and socio-economic characteristics, Mongolia, 2010

	Unmet need for contraception by purpose			CEB	Number of women (N)
	For spacing	For limiting	Total		
Age group					
15-24	11.6	4.6	16.2	1.1	629
25-39	6.4	10.0	16.4	2.4	3,314
40-49	0.7	30.1	30.8	3.7	1,838
Women's education					
Less than tertiary	4.5	17.0	21.5	2.9	4,032
Tertiary	6.6	13.3	19.9	2.1	1,749
Number of living children					
0	7.2	4.7	11.9	0.2	236
1-2	7.4	12.4	19.8	1.8	3,117
3+	2.1	21.4	23.4	4.1	2,428
Satisfaction with marriage					
Unsatisfied	5.2	20.1	25.3	2.9	542
Satisfied	5.2	15.4	20.6	2.6	5,239
Income					
No income	5.5	12.6	18.1	2.7	1,853
Have income	5.0	17.4	22.4	2.7	3,928
Area					
Rural	4.1	14.7	18.8	3.0	3,203
Aimag center	6.1	16.7	22.8	2.4	1,554
Capital city	6.9	18.1	25.0	2.1	1,024
Ethnicity of household head					
Khalkh	5.2	16.5	21.7	2.6	4,360
Other	4.9	13.9	18.8	3.0	1,421
Religion of household head					
No religion	5.0	15.8	20.8	2.6	2,760
Has a religion	5.3	15.9	21.2	2.7	3,021
Household wealth quintiles					
Poorest	3.4	15.8	19.3	3.1	1,600
Second	6.0	14.3	20.3	2.8	1,185
Middle	4.6	15.8	20.4	2.7	1,097
Fourth	5.7	18.2	24.0	2.4	1,010
Richest	7.1	15.3	22.4	2.0	889
Exposure to mass media					
Not exposure	5.2	15.8	21.0	2.7	4,815
Exposure	5.1	15.8	20.9	2.4	966
Total	5.2	15.8	21.0	2.7	5,781

In general, women's education level is increasing and somewhat higher than men's in Mongolia, especially in urban areas. But adjusted probability from

Appendix Figure A.1 shows that unmet need for contraception significantly was different among women who have less than tertiary education by place of residence.

As mentioned earlier, major ethnicity in Mongolia is Khalkh which is almost 80 percent of total population. Women who live in household which head were Khalkh are more likely to have unmet need for contraception comparing with other ethics.

In Mongolia, more than half of population (53 percent) believes Buddhism. But during the socialism (most decades of twentieth century), religion believes were illegal in Mongolia. Rooted by socialism in the past, today many people have not any religion. Based on Population and housing census 2010, 38.6 percent of people aged over the 15 years reported that they did not have any religion. There was no significant different in unmet need for contraception by religion of household head (Table 4.1).

Household wealth based on wealth index that is estimated for each of interviewed household using the information such as source of drinking water, type of sanitary facility, housing type and materials, availability of electricity, household assets employing Principal Component Analysis technique in MICS 2010 (NSO Mongolia & UNICEF, 2013). Then, households are grouped into 5 quintiles from poorest to richest. Categorizing the unmet need for contraception by the household wealth quintiles, there was no logical pattern and no difference, especially for limiting. However, unmet need for contraception for spacing among women who live in household with the richest wealth quintiles (7.1 percent) was 2 folds higher than women who live in household with the poorest wealth quintiles (3.4 percent).

4.2. Multivariate analysis

The factors affecting unmet need for contraception were investigated separately by undertaking three binary logistic regression analyses with the same independent variables.

Table 4.2-4.5 shows result of logistic regression related to total unmet need, unmet need for spacing and limiting. First logistic regression was employed with total unmet need for contraception as dependent variable (Table 4.2). According to

Table 4.2, it was revealed that women's age, income, number of living children and place of residence have significant positive influence on total unmet need for contraception while knowledge of contraception and ethnicity of household head has a significant negative influence.

But women's education, satisfaction with marriage, exposure to mass media, religion of household head and household wealth quintiles did not significant influence on total unmet need for contraception.

When number of contraception methods women knowledge increased by one, total unmet need for contraception decreased around 15 percent. This result shows that knowledge of contraception is crucial to unmet need for contraception.

With the results of logit regression, total unmet need for contraception was 31.1 percent higher among women who live in province center and 53.1 percent higher among women who live in capital city than among women who live in rural areas. This result addresses that family planning program need to focus on and attempt to reach women who live in urban areas especially in the capital city.

As mentioned in descriptive analysis, some characteristics of unmet need for contraception for limiting and spacing are different. Therefore, separate logistic regression was employed with unmet need for contraception for limiting and spacing.

Table 4.2: Result of logit regression of total unmet need for contraception on covariates, Mongolia, 2010

	Odds ratio	Sig	Confidence interval (95%)	
			Lower	Upper
Women's age	1.044	***	1.034	1.055
Women's education				
Less than tertiary[R]	1.000			
Tertiary	0.914		0.772	1.083
Number of living children				
0[R]	1.000			
1-2	1.661	*	1.100	2.510
3+	1.581	*	1.033	2.420
Satisfaction with marriage				
Unsatisfied[R]	1.000			
Satisfied	0.848		0.686	1.047
Income				
No income[R]	1.000			
Have income	1.193	*	1.028	1.384
Knowledge of contraception	0.853	***	0.814	0.894
Exposure to mass media				
Not exposure[R]	1.000			
Exposure	0.948		0.791	1.136
Place of residence				
Rural[R]	1.000			
Province center	1.311	**	1.098	1.565
Capital city	1.531	***	1.245	1.883
Ethnicity of household head				
Khalkh[R]	1.000			
Other	0.829	*	0.708	0.970
Religion of household head				
No religion[R]	1.000			
Has a religion	1.021		0.897	1.164
Household wealth quintiles				
Poorest[R]	1.000			
Second	0.992		0.809	1.216
Middle	0.918		0.735	1.146
Fourth	1.138		0.897	1.444
Richest	0.969		0.735	1.278

N=5781, LR chi2=228.00, df=16, sig=0.0000, Pseudo R2=0.0384, Log likelihood=-1047.1

****p<0.001, **p<0.01, *p<0.05, R - reference*

Second logistic regression was employed with unmet need for contraception for spacing as a dependent variable (Table 4.3). As shown in Table 4.3, women's age, and income were statistically significant effect on unmet need for contraception for spacing. The result showed the similar trend as of the total unmet need for contraception. But knowledge of contraception, number of living children, area and ethnicity of household head were turned out to be not significantly determined and household wealth quintile is turned out to be significant determined on unmet need for contraception for spacing.

Unmet need for contraception for spacing decreased when women's age increased (Table 4.3). Women who have income was more likely to have unmet need for contraception for spacing compared with women who have no income. In general, unmet need for contraception for spacing increased with household wealth quintiles.

Table 4.3: Result of logit regression of unmet need for contraception for spacing on covariates, Mongolia, 2010

	Odds ratio	Sig	Confidence interval (95%)	
			Lower	Upper
Women's age	0.885	***	0.866	0.905
Women's education				
Less than tertiary[R]	1.000			
Tertiary	0.961		0.717	1.289
Number of living children				
0[R]	1.000			
1-2	1.686		0.990	2.872
3+	1.174		0.621	2.219
Satisfaction with marriage				
Unsatisfied[R]	1.000			
Satisfied	0.827		0.547	1.252
Income				
No income[R]	1.000			
Have income	1.311	*	1.005	1.710
Knowledge of contraception	0.935		0.856	1.022
Exposure to mass media				
Not exposure[R]	1.000			
Exposure	0.819		0.587	1.143
Place of residence				
Rural[R]	1.000			
Province center	1.202		0.870	1.661
Capital city	1.265		0.875	1.830
Ethnicity of household head				
Khalkh[R]	1.000			
Other	1.116		0.836	1.489
Religion of household head				
No religion[R]	1.000			
Has a religion	1.111		0.873	1.414
Household wealth quintiles				
Poorest[R]	1.000			
Second	1.841	**	1.246	2.722
Middle	1.469		0.936	2.305
Fourth	1.965	**	1.229	3.142
Richest	2.334	**	1.397	3.900

N=5781, LR chi2=253.44, df=16, sig=0.0000, Pseudo R2=0.1080, Log likelihood=-2857.2

****p<0.001, **p<0.01, *p<0.05, R - reference*

Last logistic regression was employed with unmet need for contraception for limiting as a dependent variable (Table 4.4). In general, significant determinants and affecting direction of its on unmet need for limiting were totally similar to that of total unmet need for contraception. As shown in Table 4.4, just middle and richest quintiles of household wealth were additionally turned out to be significant effect on unmet need for contraception for limiting.

Direction of unmet need for contraception for limiting with women's age and household wealth quintiles were contrary to unmet need for spacing. For example, the unmet need for spacing decreased with the increasing ages, but the unmet need for limiting showed the opposite direction. These patterns were similar to some previous studies. Unmet need for contraception for limiting was lower among women who live in middle (0.770) and richest (0.718) household than among women who live in poorest (1.000) household while unmet need for spacing was around 2 fold higher among women who live in second (1.841), fourth (1.965) and richest (2.334) household than women who live in poorest (1.000) household.

Table 4.4: Result of logit regression of unmet need for contraception for limiting on covariates, Mongolia, 2010

	Odds ratio	Sig	Confidence interval (95%)	
			Lower	Upper
Women's age	1.107	***	1.094	1.120
Women's education				
Less than tertiary[R]	1.000			
Tertiary	0.843		0.691	1.029
Number of living children				
0[R]	1.000			
1-2	2.465	**	1.304	4.660
3+	2.545	**	1.341	4.829
Satisfaction with marriage				
Unsatisfied[R]	1.000			
Satisfied	0.858		0.676	1.089
Income				
No income[R]	1.000			
Have income	1.232	*	1.034	1.468
Knowledge of contraception	0.848	***	0.804	0.894
Exposure to mass media				
Not exposure[R]	1.000			
Exposure	1.013		0.822	1.248
Place of residence				
Rural[R]	1.000			
Province center	1.321	**	1.076	1.622
Capital city	1.579	***	1.241	2.008
Ethnicity of household head				
Khalkh[R]	1.000			
Other	0.766	**	0.638	0.919
Religion of household head				
No religion[R]	1.000			
Has a religion	0.998		0.859	1.161
Household wealth quintiles				
Poorest[R]	1.000			
Second	0.811		0.641	1.027
Middle	0.770	*	0.599	0.990
Fourth	0.968		0.738	1.268
Richest	0.718	*	0.521	0.989

N=5781, LR chi2=561.22, df=16, sig=0.0000, Pseudo R2=0.1111, Log likelihood=-2246.2

****p<0.001, **p<0.01, *p<0.05, R - reference*

CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

This study revealed that one in five (21 percent) of currently married or in union women aged 15-49 years had unmet need for contraception in Mongolia in 2010. Also women who have unmet need for limiting was three fold higher than women who have unmet need for spacing. Total unmet need for contraception was similar to the average of other Asian other countries, but the composition of it was different.

Women's demographic and socio-economic characteristics were found to have significant effect on unmet need for contraception such as women's age, knowledge of contraception, number of living children, income, place of residence and ethnicity of household head. This result is consistent with findings of other studies.

According to the comparison between factors affecting on unmet need for contraception, it was revealed that the factors affecting on unmet need for limiting were not exactly the same as the factors affecting on unmet need for spacing. However, it was also investigated that both unmet need for spacing and limiting were likely to be affected by several other common factors such as women's age, income and household wealth.

5.2. Recommendations for family planning programs

From the findings of this study, the following recommendations are suggested to decrease unmet need for contraception in Mongolia.

- ✓ Women who live in rural area, especially in capital city, need special attention when implementing family planning program.

- ✓ Knowledge of contraception of women is important to unmet need for contraception. Thus, family planning program need to focus on enhancing knowledge of contraception.
- ✓ Implementation part of family planning program should define target group separately to those who have unmet need for contraception by purpose due to characteristics of women since spacing and limiting were different.

5.3. Recommendations for further studies

From the findings of this study, the following recommendations are suggested to further studies.

- ✓ There is needed to include other important factors influencing unmet need for contraception. Particularly, decision making to using contraception among couple, women's work status, reason of not using contraception, husband's information, and accessibility to primary health care services are essential factors to unmet need for contraception.
- ✓ Qualitative researches need to be conducted to provide in-depth information on women's fertility intentions and behaviors. Its results would helps to enrich the findings from quantitative analysis.

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APPENDIX

Table A.1: Adjusted probabilities of significant determinants of total unmet need for contraception, Mongolia, 2010

	Adjusted probability	Confidence interval (95%)	
		Lower	Upper
Income (Prob > Chi2 = 0.0022)			
No income	0.187	0.171	0.205
Have income	0.229	0.209	0.252
Number of living children (Prob > Chi2 = 0.0369)			
0	0.134	0.094	0.189
1-2	0.205	0.190	0.221
3+	0.197	0.180	0.215
Place of residence (Prob > Chi2 = 0.0002)			
Rural	0.176	0.162	0.191
Province center	0.219	0.197	0.242
Capital city	0.246	0.217	0.278
Ethnicity of household head (Prob > Chi2 = 0.0185)			
Khalkh	0.206	0.194	0.219
Other	0.177	0.158	0.198

Table A.2: Adjusted probabilities of significant determinants of unmet need for contraception for limiting, Mongolia, 2010

	Adjusted probability	Confidence interval (95%)	
		Lower	Upper
Household wealth quintiles (Prob > Chi2 = 0.0068)			
Poorest	0.021	0.015	0.030
Second	0.038	0.029	0.050
Middle	0.031	0.023	0.042
Fourth	0.041	0.030	0.055
Richest	0.048	0.035	0.066

Table A.3: Adjusted probabilities of significant determinants of unmet need for contraception for limiting, Mongolia, 2010

	Adjusted probability	Confidence interval (95%)	
		Lower	Upper
Income (Prob > Chi2 = 0.0010)			
No income	0.113	0.099	0.128
Have income	0.148	0.130	0.168
Number of living children (Prob > Chi2 = 0.0059)			
0	0.056	0.031	0.100
1-2	0.127	0.115	0.140
3+	0.130	0.116	0.146
Place of residence (Prob > Chi2 = 0.0006)			
Rural	0.108	0.097	0.121
Province center	0.138	0.121	0.158
Capital city	0.161	0.137	0.189
Ethnicity of household head (Prob > Chi2 = 0.0037)			
Khalkh	0.132	0.121	0.143
Other	0.104	0.089	0.121
Household wealth quintiles (Prob > Chi2 = 0.0534)			
Poorest	0.141	0.122	0.164
Second	0.118	0.101	0.138
Middle	0.113	0.096	0.132
Fourth	0.138	0.117	0.161
Richest	0.106	0.086	0.130

Figure A.1: Adjusted probabilities of unmet need for contraception by place of residence and education

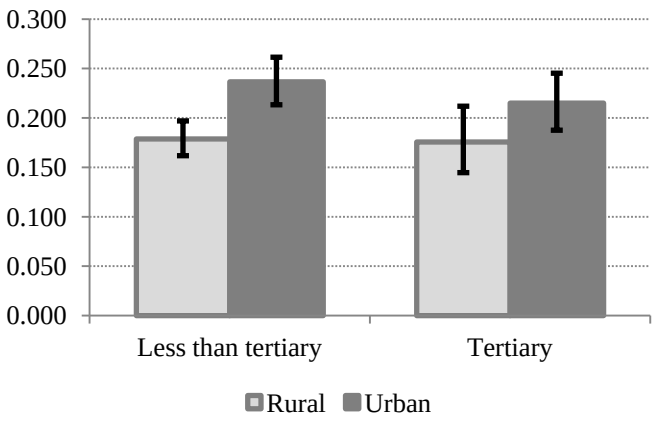


Figure A.2: Adjusted probabilities of unmet need for contraception by place of residence and number of living children

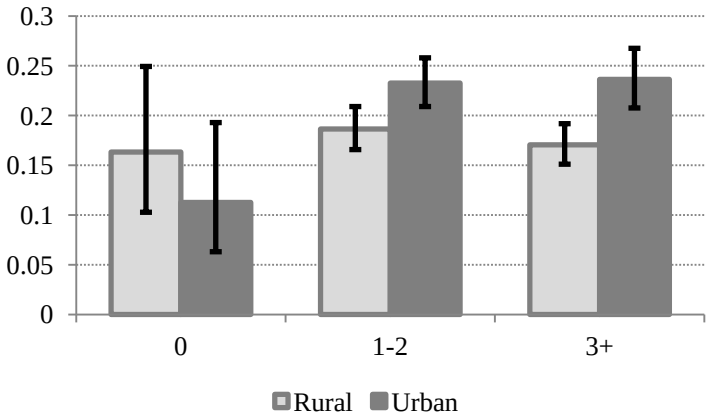


Figure A.3: Adjusted probabilities of unmet need for contraception by place of residence and income

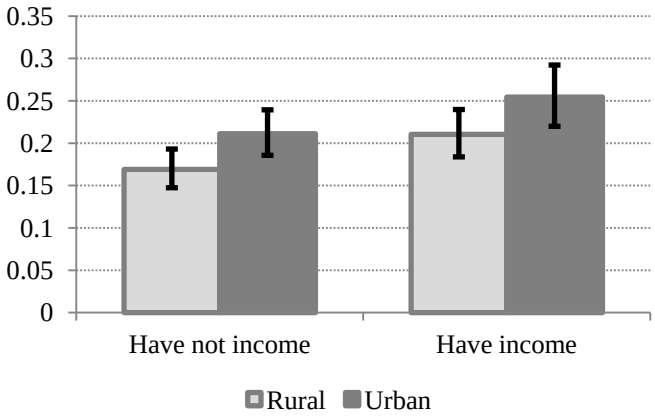


Figure A.4: Adjusted probabilities of unmet need for contraception by place of residence and ethnicity of HH head

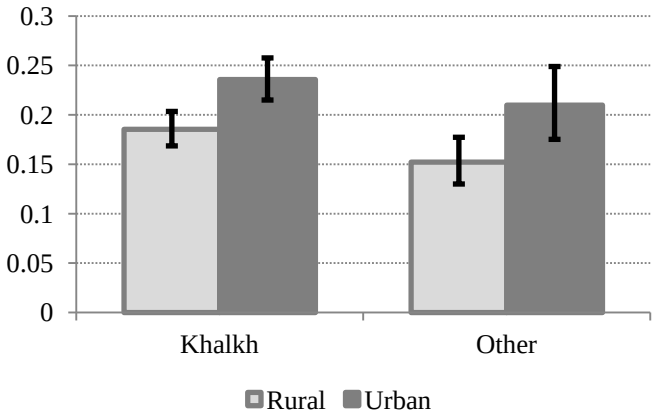
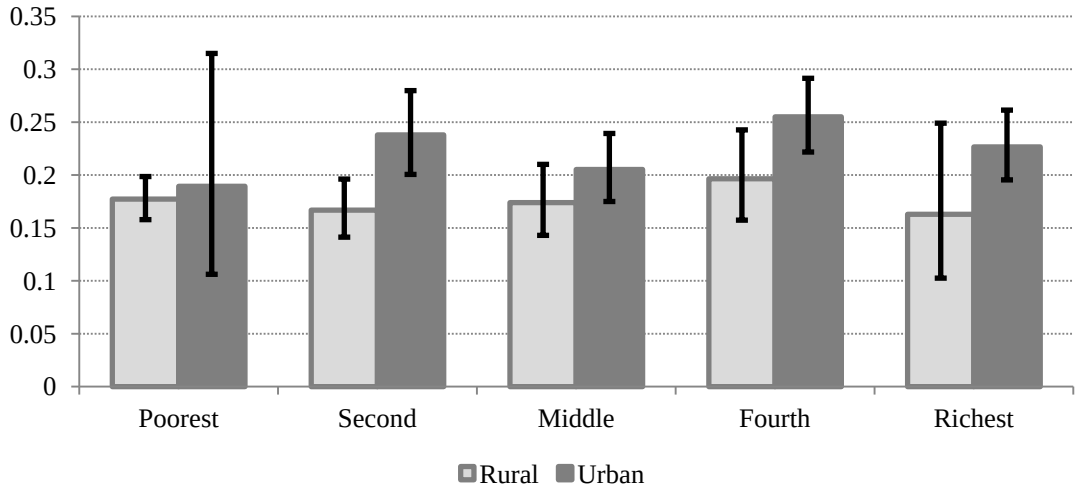


Figure A.5: Adjusted probabilities of unmet need for contraception by place of residence and household wealth quintiles



BIOGRAPHY

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