

Birth interval and associated factors among married women in Mareka woreda,  
Dawuro zone, South West Ethiopia

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Dawuro zone, South West Ethiopia

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## **Abbreviations and Acronym**

BI - Birth Interval

CI- Confidence Interval

CSA - Central Statistical Agency

DHS - Demographic and Health Survey

E.C –Ethiopian Calendar

EDHS - Ethiopian Demographic and Health Survey

FMoH - Federal Ministry of Health

JU- Jimma University

IRB - Institutional Review Board

IUGR - Intra Uterine Growth Restriction.

KM =Kilo Meter

MDG - Millennium Development Goal

MPH- Masters of Public Health

NGO –Non Governmental Organizations

OR –Odds Ratio

SBI-Short Birth Interval

SNNPRS - Southern Nations Nationalities and Peoples Regional State

SPSS-Statistical Package for Social Science

USAID - United States Aid for International Development

UNICEF - United Nation’s Children Fund

WHO - World Health Organization

## **Abstract**

*Birth interval is one of the main determinants of levels of fertility in high fertility populations. Natural fertility depends on the duration of effective reproductive span and length of birth interval. The time span between births is a subject of great interest in maternal and child health due to the association between short birth interval and adverse birth outcomes In Ethiopia, twenty percent of non first births occur less than twenty four months after the preceding birth, with eight percent occurring less than 18 months after the preceding birth. Forty-three percent of women give birth at least 36 months after the previous birth. Fifty eight percent of births occurred less than 36 months in the southern Nations Nationalities and Peoples Regional State.*

**Objectives:** *The main aim of this study is to determine potential factors associated with short birth interval and prevalence of short birth interval among married women in Mareka woreda, south west Ethiopia, May, 2014*

**Methods:** *Community based cross sectional survey was conducted from April 1 to May 1 2014. Single population proportion formula was used to determine sample size. Multistage stratified sampling technique was used to select samples and the final sample size calculated was 752. Bivariate logistic regression was applied to see association of each independent with dependent variable at 95% CI and multivariate analysis was applied to identify predictors of short birth interval.*

**Results:** *Seven hundred and three subjects were participated in this study. Response rate of the subjects were 93%. Fifty eight percent of the study subjects practiced birth interval less than 36 months and forty two percent of the study subjects practiced optimal birth interval length of 36-59 months. Average age of the study subjects was 28 years ( $\pm 5.5$ ). Place of residence AOR = 3.01(2.03-4.47), duration of marriage AOR= 1.28(1.22-3.02), type of marriage AOR=1.47(1.08-2.18), number of children currently in household AOR=1.88(1.16-3.07) and sex of the index child AOR= 3.63(2.51-5.24) were factors associated with short birth interval at 95%CI.*

**Conclusion and recommendation:** *This study reveals that there is a practice of significant proportion of short birth interval in the study area. Dawuro zone health department and Mareka woreda health office should consider this finding and work together to minimize the prevalence of short birth interval in the area.*

**Key words:** *Birth interval, Fertility, associated factors, correlates, Married women, Mareka Woreda.*

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## **Chapter1. Introduction**

### **1.1 Background**

Fertility is an important predictor of maternal mortality; with high fertility levels is associated with high maternal mortality (1). Birth interval is one of the main determinants of levels of fertility in high fertility populations. Natural fertility depends on the duration of effective reproductive span and length of birth interval(2). Lengths of time between marriage and giving birth to the first child and the interval between births have a crucial role in women's reproductive health. The number of children a woman can have during her reproductive life depends on the spacing of birth. Birth interval significantly affect on the health of mother and children (3). Birth interval is defined the length of time between two successive live births (13). Birth spacing is increasingly recognized as a major determinant of various infant health indicators including neonatal mortality(3). Birth interval of at least three years between births is one way that a mother can have more time for herself and her children particularly during the first three years that are critical to for the child's cognitive and social development(5). The time span between birth is a subject of great interest in maternal and child health due to the association between short birth interval and adverse birth outcomes(6). The topic of birth interval and the role of timing birth in maternal and child health have received increased attention because new researches that link longer birth interval with substantial reduction in mortality and morbidity(3). Birth spacing has been identified as an important life saving measure to mother and child. Optimal birth spacing, three to five-year birth interval become the global public health agenda(7).

Birth intervals are affected by a complex range of factors; some of which are rooted in social and cultural norms, others in the reproductive histories and behaviors of individual women, utilization of reproductive health services and other personal factors. Differences among groups in reproductive behavior are usually explained from the characteristics and socio-cultural perspectives (8). The length of actual birth interval is different among African countries(9).

There are significant relation between birth interval, development of the region and survival status of the children (10) .

Birth interval length between index child and the preceding child has played a significant role in reducing the risk of child mortality(11). Research from Demographic and Health Survey data by Rutstein S. Show that long birth interval has protective association with child mortality among high fertility mothers, but weak protective association with low fertility mothers. There is major health benefits to both mothers and children associated with longer birth intervals. Many mothers desire to have longer birth intervals; Others need to be informed of the advantages of longer intervals(12). A birth interval of at least 36 months before couples deliver the next child is recommended for mothers and their children (4). In Ethiopia women at age of 15-29 years practice short birth intervals(13) .

Birth spacing for at least three years can have many health benefits for children by lowering the risk for fetal, neonatal death, and lowering the risk of preterm birth, small for gestational age, birth weight, stunting and underweight. It also benefits the mother by lowering the risk for maternal death, third trimester bleeding, anemia, premature rupture of membranes, puerperal endometritis, and malnutrition (14). Longer birth intervals contribute to improved health status of both mother and child. Infants born within two years of the birth of a previous child experience a higher risk of health problems(13).

When pregnancies and births are spaced too closely together, women do not have sufficient time to re-build nutritional stores; there is an additional physiological stress incurred when a short interval causes an overlap in gestation and lactation (14). The potential effects of the realization of birth spacing preferences will be more useful for policy purposes if we know the characteristics of women who prefer intervals of different lengths(9).

## 1.2 Statement of the problem

In Sub Saharan Africa total fertility stood at 5.6 births per woman from 2005-2010 (15). However declining infant, child and maternal mortality rate currently ,Ethiopia is characterized by a very high fertility rate, low life expectancy, high maternal and child mortality, poor nutritional status, high infant mortality, low per capita income (16). In Ethiopia total fertility rate in 2011 was 4.8 per women which are among the highest total fertility rates in the world. Total fertility rate in Southern Nations, Nationalities and People Region is 4.9 per women. Contraceptive prevalence rate for all Ethiopian women in reproductive age group (15-49) is 20 percent in 2011. Unmet need for family planning in currently married women in Ethiopia is 25% of which 16% for spacing and 9% for limiting In Ethiopia, the overall median birth interval is 34 months, 20% of non-first births occur less than 24 months after the preceding birth of which 8% occurring in less than 18 months, about 43% of women give birth at least 36 months after the previous birth. Median number of months since preceding birth to age group 15-19, 20-29, 30-39 and 40-49 years aged women were 26,31,35and 38 months respectively(13).

Every year over 245,000 African women die due to complications related to pregnancy and childbirth (17). Demographic and Health Survey result from different developing countries from the world ,North Africa and sub Saharan shows that percent of birth interval that are short for selected developing countries like Uganda, Guatemala, Morocco and Bolivia was 70%,68%,67% and 65% respectively (18).

Demographic and Health Survey in Eastern and Southern Africa (9)show that if the preferred birth intervals were realized ,the total fertility rate would decline by an average 17% and neonatal ,infant and child mortality rate would decrease by 17%,13% and 11% respectively. Compared with children born less than 2 years after a previous birth, children born 3 to 4 years after a previous birth are: 1.5 times more likely to survive the first week of life; 2.2 times more likely to survive the first 28 days of life; 1 2.3 times more likely to survive the first year of life; 1 2.4 times more likely to survive to age five (3).

Ethiopia's achievement in reducing child mortality has been remarkable, but still today, 1 of every 17 Ethiopian children dies before age 1 year (19).

Recent study in Southern Nations Nationalities and Peoples Regional State of Hadiya zone show that fifty eight percent of married women had short birth interval in (20). Family planning can improve child health and survival by preventing births to older and younger women (ages that carry increased risks to maternal health), reducing the number of births per woman, and lengthening the interval between births(21).

However, Ethiopia has formulated national population policy before two decades and increased improvements in access of reproductive health services both in urban and rural areas of the country; fertility rate of the country is still high and there is slight progress in use of modern method of contraception in the country. As the Demographic and Health survey report result show that the difference of median length of birth interval between Ethiopian Demographic and Health Survey of 2005 and 2011 is 2 months(13). A few studies have been conducted on birth interval and associated factors in the region and no research have been conducted on the same topic in the study area using primary data.

Therefore, this study assessed factors affecting birth interval length at woreda level using primary data and to generate piece of information on length of birth interval and to inform stakeholders that work on fertility control and to fulfill the gaps in birth interval particularly in the study area and to those areas with similar socio- cultural and demographic characteristics.

## Chapter 2. Literature Review

To reduce infant and child mortality and to benefit maternal health World Health Organization recommends a birth interval of three to five years (4). Systematic literature review and Meta analysis from cross sectional and cohort studies from different developing countries show that there are association in birth interval and neonatal, post-neonatal, infant, child, and under-five mortality. The result of meta analysis show that length of preceding birth interval is highly related to the risk of dying in early childhood (22).

Study in Latin America on association of birth Intervals and prenatal , maternal and adolescent health show that Woman with short birth interval had the highest rate of third trimester bleeding, premature rapture of membrane, puerperal endometritis , anemia and maternal death(23). Study by Sonia. B in India shows that neonatal mortality is related with preceding birth interval. Short birth interval is negatively associated with child's chance of survival(24). Study in Nigeria show that short birth spacing may have a negative effect and affect the quality of parenting for children. Birth interval less than 2 years may exacerbate mothers to iron deficiency anemia(5).

The rates of preeclampsia, eclampsia and gestational diabetes mellitus were highest among women with intervals longer than 68 months(23).

A short birth interval could be risky if the mother's nutrient reserves become depleted which could increase the risk of intrauterine growth retardation and adversely affect infant nutrient stores at birth and nutrient delivery via breast milk(25). Short birth interval less than 3 years is significantly associated with breast cancer(26). The adverse health effect short birth interval for infant and child survival have been attributed to biological effect of related to the maternal depletion syndrome(27).

Lengthening the birth interval increases child's survival and it gives mother more time to breast feed and to recover from the physical strain of pregnancy, child birth and breast feeding infant faces less competition for resources like mother's care is the preceding birth interval is long. Lengthening birth interval decreases the probability of contracting child hood infectious diseases from one to another. Spacing birth to 36 months benefit mothers by reducing the risk of maternal death(27).

Children born three to five years after the last birth were about 2.5 times more likely to survive than children born two years or less after the last delivery. Women with longer birth intervals were more likely to avoid anemia and third trimester bleeding, and less likely to experience fetal growth retardation and premature delivery, which result in low birth weight neonates (7).

Birth spacing for at least three years can have many health benefits for children by lowering the risk for fetal, neonatal death, and lowering the risk of preterm birth, small for gestational age, birth weight, stunting and underweight. It also benefits the mother by lowering the risk for maternal death, third trimester bleeding, and anemia, premature rupture of membranes, puerperal endometriosis, and malnutrition(14).

Study from Demographic and Health Survey data from developing countries in Latin America and Africa show that percent of birth interval that are short for Uganda, Guatemala, Morocco and Bolivia was 70%,68%,67% and 65% respectively(12).

In Ethiopia, 20 percent of non- first births occur less than 24 months after the preceding birth, with 8 percent occurring less than 18 months after the preceding birth. Forty-three percent of women give birth at least 36 months after the previous birth. The overall median birth interval is 34 months. Half of the births in Ethiopia occur close to three years after the previous birth. Thirty-seven percent of births to women age 15-19 occurred within two years of the previous birth, compared with only 14 percent of births among women age 40 and above. The median birth interval rises from 26 months among women age 15-19 to 38 months among women age 40 and above(13).

Birth intervals are affected by a complex range of factors; some of which are rooted in social and cultural norms, others in the reproductive histories and behaviors of individual women, utilization of reproductive health services and other personal factors. Group differences in reproductive behavior are usually explained from the characteristics and socio-cultural perspectives (28). Socio economic factors such as urban residence, maternal education, age at marriage, knowledge and access to contraception, employment and values regarding family size have considerable association with birth interval. Several aspects of women's' fertility behavior also affect child health and survival including mothers age at the birth of her first children length of birth interval and a number of births a woman had. Family planning can improve child health

and survival by preventing births to older and younger women reducing the number of births per woman and lengthening the interval between births.(10,13,29).

## **2.1 Factors associated with length of birth interval**

### **Socio economic and demographic factors**

Education is among one of the socio economic variables that affect the length of birth interval. Education affects birth interval length by its effect on biological variables like breast feeding, sexual abstinence and frequency of sexual intercourse. Maternal education is associated with fewer children and a lower probability of a recent birth. A high education will delay the age of mother by keeping women at school and labor force. Education with its social and economic correlates exposes a women to wide range of general information like attitude, favorable knowledge and access to modern and effective methods of family planning(29).

Many studies (8) show that maternal education is associated with birth interval. Women with no education were more likely than women with education to space births less than 3 years. Mothers with no education and primary education practice birth interval length less than 3 years when compared to those with secondary and above education. With an increasing level of education the birth interval is longer, but the trend reverses for women with higher education, being female of the first birth shortens the birth interval(17,30) Preferred birth interval increases with increase in woman's knowledge and contraception use (9).

Contraception use increases in women who are participated in labor force and there by increases the length of birth interval. Working women do not require support from their child at old ages. Women's employment increases contraceptive use behavior and decreasing fertility. Women engaged in work outside the home tend to have smaller fertility as compared with those who work inside the home. Women with lower status whether working inside or outside the community and unemployed practice short birth interval than women of higher status or who are employed practice long birth interval(29).

Another Study (31) show that the current positive effect of labor participation motivates women to delay the next birth three to five years, while the further participation effect is negative and



encourages woman to have their second child one to two years earlier; these participation effects on child birth spacing become stronger with fewer years.

Many studies evidenced that place of residence is associated with women's place of residence. Among socio demographic factors place of residence is also associated with birth interval. Women who reside in rural area practice short birth interval(18).

Age of mother is associated with the length of birth interval. Birth interval tend to be shorter among younger women 15-19 years old and long among in age group 40- 49 and this is due to variation in fecundity through reproductive age(29).

There are differences in birth interval length among different ethnic and religious groups can be largely explained by difference in cultural practices. Some cultures promote the practice of prolonged breast feeding and sexual abstinence after bearing a child where as other cultural practices prohibit the practice of prolonged breast feeding and contraceptive use. Cultural norms like peer pressure, preference to son affect birth interval. Couples who prefer son practice short birth interval(29). Study in Iran (32) show that religion is associated with the length of birth interval. Study in Northern Ethiopia on proximate determinants of birth interval (28) show study subjects of protestant families have on average longer birth interval than other religions.

Study in Tanzania (33) show that the lower the maternal age, the higher the likelihood of non-adherence and vice versa. Inter-birth intervals observed among women aged between 15–19 years were about 14 times more likely to be poorly spaced compared to inter-birth intervals observed among women aged 45–49. Young age at marriage is associate with short birth interval (2). Ethiopian Demographic and Health Survey result on fertility differential show that birth interval is short among women at age 15-29 and as age of the women increases the median birth interval also increases. Median number of months for women in age groups 15-19,20-29,30-39 and 40-49 was 26,31 ,35 and 38 months respectively(13).

Study on birth interval and its predictors in northern Ethiopia, Dabat(34) show that paternal education and occupation affect the length of birth interval . Birth interval is short for women whose husband's had no formal education compared to those with at least secondary education and this might be due to the reason that couples who had better education were more likely to

access contraceptive methods and favorable attitude and awareness to space birth than those who had no education. Those who can read with difficulty are the most likely to have intervals less than three years(30).

Study in pastoralist community of southern Ethiopia(8) show that woman whose partners' engaged in daily work were practiced short birth interval.

### **Reproductive aspirations and history**

In addition to these contextual factors, there are others more proximate factors that could influence the length of an inter-birth interval. These include the type and nature of a woman's relationship, whether her partner resides with her, her reproductive aspirations, her reproductive history, and her reproductive behavior. Not surprisingly, women who are currently married (or in union) or are co-residing with their husband (or partner) are more likely than others to have short intervals given the greater exposure to sexual activity and pregnancy(30). Women who want more children practice short birth interval compared to women who do not want more child. Women who do not intend to use contraception reason their non use to have more children (13,30).

### **Biological factors**

Breastfeeding is among the biological factors which affect birth interval(8,31,36). Breastfeeding, abstinence and the use of contraception are some examples of social and reproductive behaviors that can influence inter-birth length. For example, nursing-especially exclusive breastfeeding can extend the period of post-partum amenorrhea, thereby lengthening the interval between births. Abstaining or using contraception work more directly by postponing the occurrence of the next pregnancy. The combination of these behaviors affects the resulting birth interval. Breastfeeding for up to six months reduces short inter-birth intervals; for example, 48 percent of women who did not nurse are likely to have intervals less than three years compared to 39 percent of those who had nursed between one and six months. However, nursing beyond six months does not increase the interval further.

## **Behavioral factors**

Contraceptive use has positive association with length of birth interval. Length of birth interval between two successive live births varies among contraceptive users and non contraceptive use. Women who did not use modern contraceptive were more likely to practice short interval length as compared to those who used modern contraceptives(8,13,28-29 ).

Service utilization with a focus on maternal and child health services affects as points for disseminating information on birth spacing. Women tend to use antenatal services—over three-quarters of women had used antenatal care(30). Compared to women who had prenatal care and number of prenatal visits ,women with lower number of prenatal visits, were associated with short intervals(23).

## **Past obstetric and gynecological factors**

Survival status of index child is significant factors of birth interval. The death of index child in infancy or childhood has been found to be related with short birth interval(in settings as separate as and Tanzania(33). This might be of several reasons; sometimes, parents purposely plan a new pregnancy to replace a lost child. There are unintentional reasons for short spacing too the death of a child cuts short nursing durations which results in earlier resumption of menses and ovulation. Study in India, Manipur (2) show that the risk of having subsequent birth with a preceding birth of male child is lower than those with a preceding birth of female child. Women with the survival of previous child are less likely to practice short birth interval compared with the women having the death of the previous child

Recent case control study conducted in pastoralist community of Ethiopia , Yabello(8) show that proportion of short birth interval less than 3 years when the sex of the preceding birth is female and male is 61% and 42% respectively.

Number of live children affects the length of birth interval. Study in Mozambique(30) on Correlates of inter-birth interval show that those who have suffered loss of pregnancy or child are more likely to replace that pregnancy/child and hence the interval between births is short. Women who conceive easily and quickly are also those who are more likely to have more

children Women who do not want any more children are nearly two times more likely to report their previous birth as unintended as compared to those who want more children(35).

## **Mass media**

Study in Bangladesh show that exposure to mass media affect fertility(36). Access to mass media plays significant role to raise consciousness about the family planning program on general peoples and affect birth interval) and evidence from demographic and health survey (18).

## **Significance of the study**

Birth interval affects health of both the mother and survival and performance of the children. Therefore this study designed to assess factors affecting birth interval at district level .The findings of this study will be used to indicate the areas of intervention for program planners, policy makers, local decision makers, health care providers and local nongovernmental organizations working on family health and fertility control. It is also important to aware communities in risks related to short birth interval and to bring behavioral change based on characteristics of women who practice intervals of different lengths. Since a few studies have been conducted to identify factors associated with length of birth interval at the study region and district levels using primary data; therefore, this study assessed factors affecting birth interval length at the woreda level using primary data and information generated from this study can be used as a baseline data for other studies in the future.

This study was conducted to identify factors associated with short birth interval and to add some piece of information particularly in the study area and to those areas with similar social cultural and demographic characteristics.

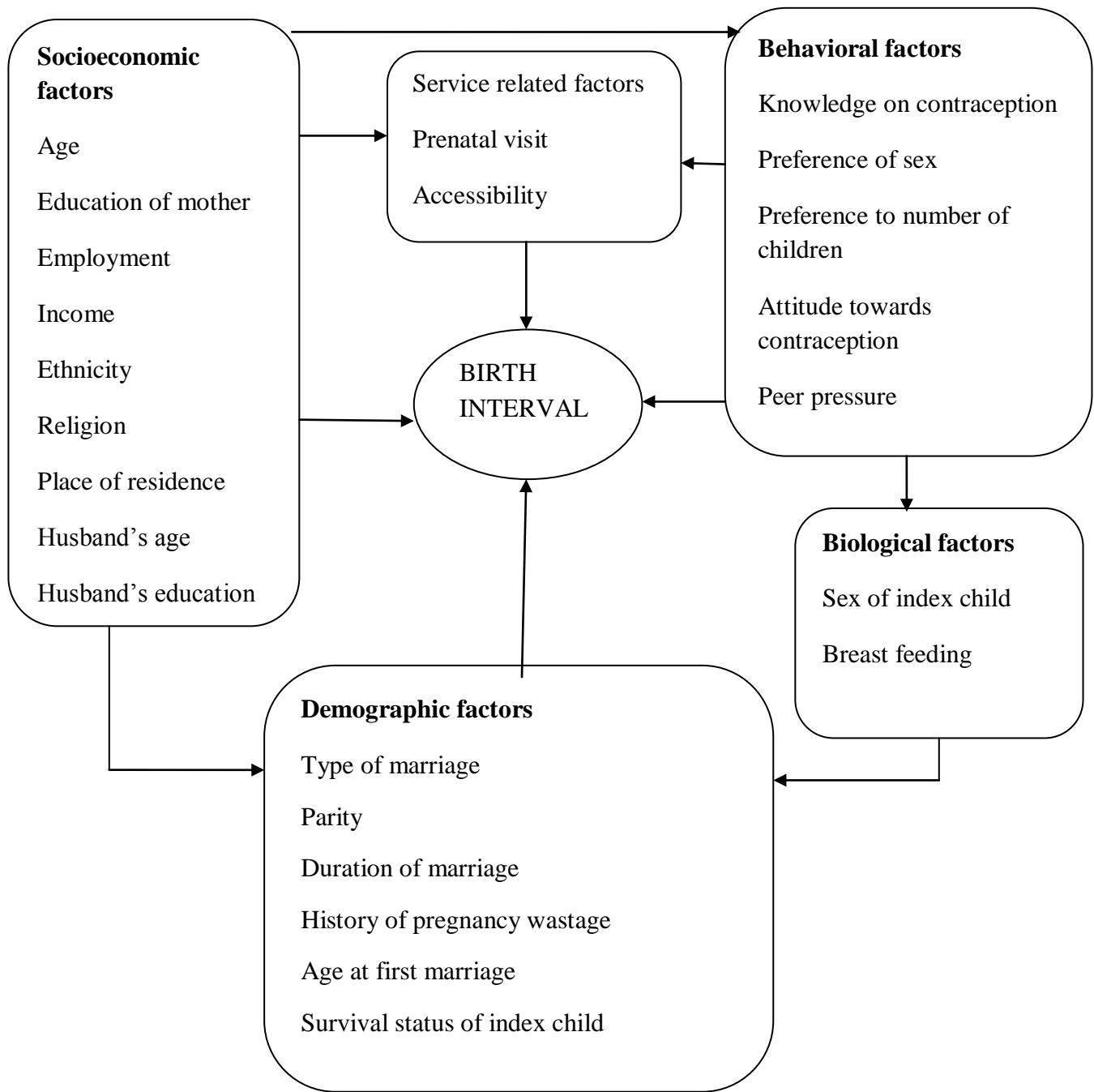


Figure 1: Conceptual frame work of birth interval among married women (Adapted by Investigator from different literatures.

## **Chapter 3. Objectives**

### **3.1 General objective**

To determine the prevalence of short birth intervals and its potential correlates among married women in Mareka woreda south West Ethiopia.

### **3.2 Specific objectives**

1. To estimate the prevalence of optimal birth interval among married women in Mareka woreda.
2. To identify socio economic and demographic factors associated with birth interval among married women in Mareka woreda.
3. To assess service related and biological factors affecting birth interval among married women in Mareka woreda.

## **Chapter 4. Methods and participant**

### **4.1. Study area and period**

A community based cross sectional study was conducted in Mareka woreda, Dawro zone, South west Ethiopia from March 1 to April 1, 2014. Mareka woreda is located 556 Km from country's capital Addis Ababa, 270 km from the regional capital Hawassa and 17 km from zonal capital Tercha. The woreda shares boundary with Lomma woreda in the east and south east, Tocha woreda in the west, Gena Bossa woreda in the north and north east, Isera woreda in the south west. According to 2007 population and housing census, projected population of the woreda is 137,314 of which 67,284 male and 70,030 female. Female population of reproductive age group is 16,107. The district has 34 rural and 3 urban kebeles. There are 4 health centers and 37 health posts which deliver comprehensive health services to the communities in the district. There are 146 all types of health professionals of different discipline in the district. The local communities in the district largely depend on agriculture.

### **4.2 Population**

#### **4.2.1 Source population**

All women in Mareka woreda in age group 15-49 years were considered as a source population.

#### **4.2.2 Study population**

All married women in Mareka woreda in the age group between 15-49 years and who have at least two live births with in April 2009 to April 2014 during the study period were considered as study population in this study.

#### **4.2.3 Study unit**

The study subjects were currently married women who have at least two live births and satisfied the inclusion criteria were included in the sample.



### 4.3 Inclusion and exclusion criteria

#### 4.3.1 Inclusion criteria

Women currently married and in the age group 15-49 years and had at least two live births within 5 years prior to this study were included in this study.

#### 4.3.2 Exclusion criteria

Women those do not satisfy an inclusion criteria were excluded from the study.

### 4.4 Sample size determination

Single population proportion formula was used to determine the sample size.

$$n = \frac{Z (\alpha/2)^2 * p (1-p)}{d^2}$$

Where,

n= sample size

Z $\alpha/2$ =confidence level (1.96)

d=margin of error 0.05

p=0.57% proportion of women practicing short birth interval in SNNPR from similar studies was used(20).

$$n = (1.96)^2 * 0.57(1-0.57) / (0.05)^2$$

$$n = 376 \text{ Design effect } 2 = 752$$

### 4.5 Sampling technique and procedure

A multi-stage stratified sampling technique was used to select the target population. Considering representativeness, from the total of 37 kebeles 30 % ( 11 of the kebeles) were included in the study. Kebeles were selected by using simple random sampling. From these selected kebeles, households with mothers of two successive live births in the last five years were enumerated prior to data collection. **After enumeration, sampling frame was prepared and simple random sampling was used to select the study subjects from sampling frame Samples were allocated proportionally to each kebele.**

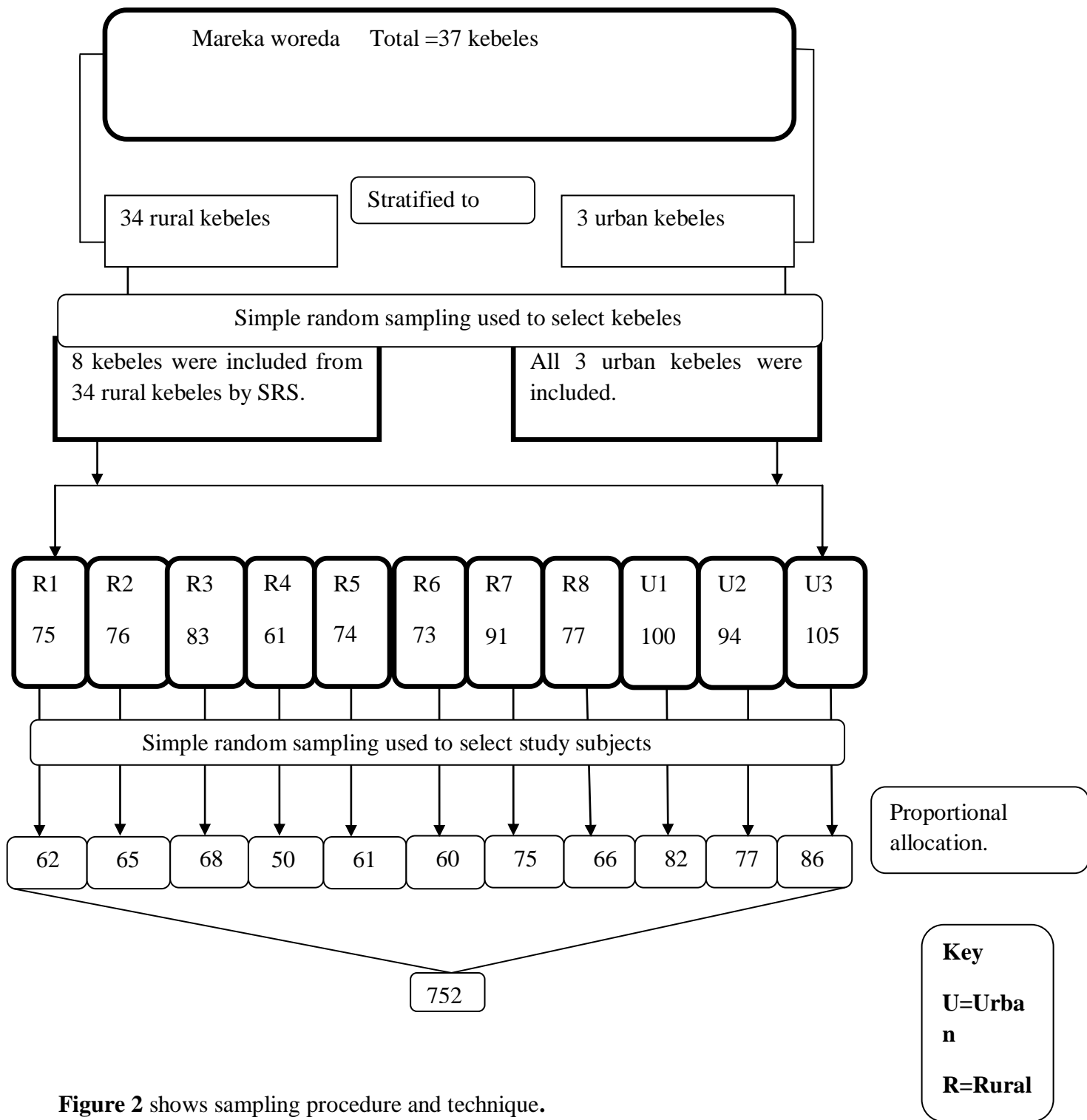


Figure 2 shows sampling procedure and technique.

#### **4.6. Data collection tool**

Data were collected by face to face interview with pre tested semi Structured questionnaire initially prepared in English and translated to Dawrogná by Dawrogná language expert and translated back to English by English language expert. The questionnaire consists of socio economic and demographic variables of the mother, fertility, birth history, and breast feeding practice, knowledge on contraception, marriage, and husband's socio economic and demographic variables.

#### **4.7. Data collection method**

Data were collected by face to face interview with 6 diploma nurses under the supervision of investigator, 2 Bsc nurses and 1 health officer who were recruited as supervisors.

#### **4.8. Data analysis**

Data was checked, cleaned and edited for completeness, outliers and missing values. Quantitative data was entered to Epi Data version 3.1 and exported to SPSS for windows version 16.0 for analysis. Descriptive analysis was carried out for each of the variables. Bivariate analysis was employed to check association between dependent and independent variables. Variable with p value  $<0.25$  on bivariate analysis was entered to multivariable logistic regression model to identify the factors that are associated with short birth interval. Statistical significance was declared at P value  $<0.05$ . The summary result of quantitative data was compared by frequency tables, graphs, and charts and analytically presented by adjusted odds ratio and 95% confidence interval

#### **4.9. Data quality assurance**

Two days training was given to data collectors and supervisors on over view of the need to conduct a research, target population of the study, how to approach and to collect the required information from the respondents. Duties of enumerators and supervisors to implement the fundamental principles of research ethics were also presented. Discussion on the data collection tool was carried out during the training period. Incomplete questionnaires were completed by second visit to the study subjects Visits to the homes. Pretest was conducted in 5% of the study subjects to test the data collection tool. Day to day supervision was carried out by investigator and 2 Bsc nurses and 1 Health officer from health centers.

#### **4.10. Ethical clearance**

Ethical clearance was obtained from Health Research and Post Graduate College of Public Health and Medical Sciences Ethical Review Board of Jimma University. Formal letter of permission was obtained from administrative bodies of the Dawuro zone, Mareka Woreda and selected kebeles. Letter of cooperation from kebeles administrators was also secured. Finally, verbal consent obtained from every study participant included in the study during data collection time after explaining the objectives of the study. Confidentiality was also assured accordingly.

#### **4.11. Dissemination plan of the study finding**

The result of this study will be presented to Jimma University community as part of Masters of Public Health (MPH) thesis and it is disseminated to Jimma University College of public health and medical science, department of Epidemiology, Dawuro zone health desk, Mareka woreda health office and to the targeted health facilities and Non-governmental organizations working on family health in the study area. Further attempt will be made to publish it on national scientific journals.

## 4.12. Study variables

### Dependent variable/ outcome variable-

- Birth interval

### Independent variables/predictors:

- Maternal Education
- Paternal Education
- Number of children
- Maternal Occupation
- Duration of marriage
- Income
- Ethnicity
- Religion
- Residence
- Age of women
- Husband Occupation
- Age at first marriage
- Survival index
- Sex of index child
- Breast feeding
- Use of contraception
  - Sex preference

#### 4.1 Operational definition and definition of terms

- 1) **Ethnicity:** The cultural practices, language, cuisine, and traditions—not biological or physical differences used to distinguish groups of people.
- 2) **Parity:** The number of children previously born alive to a woman;
- 3) **Married Women:** Women who are living with their partner.
- 4) **Accessibility:** If health service is within 10 km to home.
- 5) **Educational status:** Refers to the highest level of education attended by the respondent during the time of survey.
- 6) **Age:** Refers to the reported respondent's age in completed year at the time of survey.
- 7) **Income:** For rural study participant calculated in kind the crop, cattle changed in to monetary forms.
- 8) **Birth interval-** The number of months between the birth of the child under study and the immediately preceding birth to the mother.
- 9) **Short birth interval** - Birth occurred in <36 months between births.
- 10) **Optimal birth interval:** Births occurred in 36-59 months between births.
- 11) **Fertility:** The actual reproductive performance of an individual, a couple, a group, or a population
- 12) **Total fertility:** The average number of live births a woman would have by age 50 if she were subject, throughout her life.
- 13) **Duration of breastfeeding:** This period is the entire period during which the child is fed on breast milk or without supplements liquid or solid.
- 14) **Fecundity:** The physiological capacity of a woman to produce a child.

## Chapter 5 Result

Seven hundred and three subjects were participated in the study with response rate of 93%. The mean age of study subjects was 28 years ( $\pm 5.5$ ). Relatively large numbers of study participants 309(44%) were within the age group of 25-29 years. Majority of the study subjects 680 (97%) were Dawuro in ethnicity. Nearly two third, 477 (70%) and 190 (27%) of the participants were followers of protestant and Orthodox religion respectively. 267(38%) of the households were in income category of 1<sup>st</sup> quartile, 110(15.6%) of the study subjects were in 2<sup>nd</sup> quartile, 171(24.3%) of subjects were in income category of 3<sup>rd</sup> quartile and 155(22%) of the subjects were in income category of 4<sup>th</sup> quartile (Table 1).

**Table 1 :Socio-demographic characteristics of the study subjects, Mareka woreda,Dawuro Zone, South west Ethiopia ,May 2014(n=703)**

<b>Variables</b>	<b>Number (%)</b>
<b>Age group of subject by year</b>	
15-24	93(13.2)
25-34	475(67.6)
35-49	135(19.2)
Total	703(100)
<b>Place of residence</b>	
Urban	242(34.9)
Rural	458(65.1)
<b>Monthly income in ETB</b>	
1 <sup>st</sup> quartile	267(38%)
2 <sup>nd</sup> quartile	110(15.6)
3 <sup>rd</sup> quartile	171(24.3)
4 <sup>th</sup> quartile	155(22.0)
Total	703(100.0)



<b>Ethnicity</b>	
Dawuro	680(96.7)
Others	23(3.3)
Total	703(100)

More than half of the study subjects (56.7%) get married when they were at age greater than 18 years and the remaining 44% get married when they were age below 18 years. Thirty two percent of the subjects get married at age >18 years. Mean number of children ever born to a woman was 3.5. Minimum and maximum numbers of children ever born to woman were 2 and 9 respectively. Five hundred fifty two (80%) of the study subjects had living children of 2-3 currently, 141(20%) had living children of >3. Among the study subjects, 661(94%) had a history of live index child where as forty two percent of the study subjects had history of death of index child. From a total of 703 study subjects, forty nine percent were male index child and the rest fifty one percent were female index children. About fifty six percent of the study subjects had under 1 children currently and the rest forty four percent had no under 1 year children . Eighty four percent of the participants had marriage duration of less than 15 years and sixteen percent had duration of marriage greater than 15 years. More than quarter of births (78.2%) in the study area were in birth order of 2- 3. (Table 2)

Table 2: Past obstetric and biological characteristics of the study subjects among married women Mareka woreda,Dawuro zone, southwest Ethiopia ,May 2014(n=703)

<b>Variables</b>	<b>Number (%)</b>
------------------	-------------------

Age at marriage	
≤18 years	312(44.3)
>18 years	391(56.7)
Total	703(100)
Duration of marriage	
5-15 years	589(84)
16-28 years	114(16)
Total	703(100)
Number of live children ever born to women	
2 children	211(30)
3-4 children	339(49)
≥5 children	153(21)
Total	703(100)
Sex of index child	
Male	355(50.5)
Female	348(49.5)
Total	703(100)
Birth order	
2-3	550(78.2)
>3	153(21.8)
Total	703(100)

**From seven hundred three study subjects participated in this study, four hundred and eleven subjects practiced short birth interval and two hundred ninety two subjects practiced optimal birth spacing. Twenty eight percent of the births occurred less than 25 months to the preceding birth, thirty percent of the births occurred within 25 to 35 months. The remaining twenty seven and fourteen percent of births occurred with 36 to 45 months and 46 to 59 months respectively. The median length of birth interval in this study was 33 months (Table 3)**

**Table 3: Length of short birth interval among married women in Mareka woreda, Dawuro zone, South west Ethiopia ,May 2014(n=703)**

Length of month between children	Number (%)
----------------------------------	------------

14-35months	411(58)
36-59 months	292(42)
Total	703(100)
Median length between births in months	33 months

When compared to age group, of the total proportion of short birth intervals, high proportion of short birth interval (39%) was in women age group 25-34 years. Eight percent of short birth intervals occurred in women age group 15-24 years. The remaining eleven percent of short birth interval was in age group 35-49 years. From the total of two hundred ninety two study subjects practiced optimal birth intervals, five percent were in age group 15-24 years. Proportion of optimal birth interval in women age group 25-34 years and 35-49 years was twenty eight and eight percent respectively (Table 4)

**Table 4** Distribution of short and optimal birth interval by age group among married women in Mareka woreda, Dawuro zone, south west Ethiopia, May 2014(n=703)

Age group	Short birth interval	Optimal birth interval	Total
	Number-(%)	Number (%)	Number (%)
15-24 year	55( 7.8 )	38(5.4 )	93(13)
25-34 years	277( 39 )	198(28 )	475(68 )
35-49 years	79( 11 )	56(8 )	135(19 )
Total	411(58 )	292( 42)	703(100 )

From the total of 411(58%) of short birth intervals 28% of the short birth intervals were within 14-24 months and the remaining 30% were in between 25-35 months.

**Bivariate results:** In bivariate logistic regression, variables associated with short birth interval were; place of residence, husband's marriage type, duration of marriage, education of mother, additional people in the household, additional work outside home, ideal length of year of child spacing, sex of the index child, women with under one children, number of living children husband's living place were associated with short birth interval (Table 5)

**Table 5:** Socio demographic factors associated with short birth interval in bivariate analysis, Mareka woreda, Dawuro zone south west Ethiopia, May 2014(n=703)

variables	Short birth interval	COR(95% CI)	p-value
-----------	----------------------	-------------	---------

	Yes	No		
Place of residence				
Rural	298(42)	160(23)	2.66(1.89-3.19)	<0.001
Urban	102(15)	143(20)	1.00	
Type of marriage				
Monogamy	323(46)	118(17)	1.34(4.73-9.32)	<0.001
Polygamy	185(26)	77(11)	1.00	
Read and write				
Yes	194(28)	206(29)		0.01
No	139(20)	164(23)	1.00	
Additional people in household				
Yes	313(44.3)	87(12.3)	1.69(1.20-2.36)	<0.001
No	206(29.3)	97(13.7)	1.00	
Husband lives his family				
Yes	269(38.9)	131(18)	3.13(0.54-1.03)	0.06
No	120(17)	183(26)	1.00	
Duration of marriage				
≤15 years	348( 49)	241(34)	1.24(1.15-2.58)	<0,001
>15 years	62( 9)	52(7)		

Among past obstetric and gynaecological factors,sex of the index child COR =4.67(3.37-6.97)women withb under one year children COR=1.20(0.88-1.62), and number of live children COR=1.33(0.91-1.94)were associated with short birth interval(Table 6).

**Table 6: past obstetric factors associated with short birth interval among married women in Mareka woreda, Dawuro zone south west Ethiopia, May 2014.(n=703)**

variables	Short birth interval		COR(95%CI)	p-value
	Yes	No		
	Number(%)	Number(%)		
Sex of index child				
Female	252( 35.7)	81(11.5)	4.67(3.37-6.97)	<0.001
Male	148(21.5)	222(31.5)	1.00	
< 1 year children				
Yes	217(32)	178(25)	1.20(0.88-1.62)	0.23
No	183(26)	125(17.5)	1.00	
Number of children				
2-3 children	312(44.3 )	88(12.5 )	1.33(0.91-1.94)	0.14
>3 children	250(35.5 )	53(7.5 )	1.00	

In multivariable logistic regression, type of husband's marriage AOR= 1.47(1.08-2.18), place of residence, AOR=3.019(2.038- 4.471), sex of index child AOR=3.631(2.514-5.242), duration of marriage AOR=1.28(1.22-3.02), number of children living in house hold AOR=1.885(1.16-3.067) were associated factors with short birth interval (Table 7)

**Table 7:** Factors associated with short birth interval in multivariable logistic regression among married women in Mareka woreda Dawuro zone South west Ethiopia, May 2014(n=703)

Variables	Short birth interval			
	Yes		No	
	Number (%)	Number (%)	COR(95%CI)	AOR(95%CI)
Sex of index child				
Female	252(35.7)	81(11.5)	4.67(3.37-6.97)	3.63(2.51-5.24)*
Male	148(21.5)	222(31.5)	1.00	1.00
Number of children				

2-3 children	312(44.3)	88(12.5)	1.25(0.92-1.70)	1.88(1.16-3.07)*
>3 children	250(35.5)	53(7.5)	1.00	1.00
Duration of marriage				
<=15 years	348(49)	241(34)	1.33(0.91-1.94)	1.28(1.22-3.02)*
>15 years	62(9)	52(7)	1.00	1.00
Husband's marriage type				
Monogamy	198(28)	206(29)	1.34(1.47-3.24)	1.47(1.08-2.18)*
polygamy	139(20)	164(23)	1.00	1.00
Place of residence				
Rural	298(48)	160(23)	2.66(1.89-3.59)	3.01(2.03-4.47)*
urban	102(15)	143(20)	1.00	1.0

\*Significant at p- value <0.05

## Chapter 6. Discussion

This community based cross sectional study used data on socio economic, demographic, past obstetric history of women and information related to husband. Socio demographic and past obstetric factors were associated with short birth interval. Median length of birth interval in this study was 33 months. Prevalence of short birth interval in the study area was high. From a total of 703 subjects participated in the study, 58% of the study subjects were practiced short birth interval. Our finding is in line with study in Hadiya, Lemo district report of proportion of short birth interval of less than 36 month of 57%. In this study median birth interval between two successive live birth was 33 months, which is comparable to study conducted in Hadiya Lemo district reported that median birth interval was 33 month(20). In Ethiopian Demographic and Health survey report birth interval less than 36 month was 56%(13). Forty two percent of the

study subjects had a practice of optimal birth interval. Proportion of optimal birth interval is higher compared to study conducted in Manna; Jimma zone (35) reported that proportion of optimal birth interval in the area was 34.9 percent. Proportion of optimal birth interval in our study is greater than this study. Women with preceding daughter children, women reside in rural area, number of children a woman had, duration of marriage and husband's marriage type were factors associated with short birth interval in multivariate logistic regression. Place of residence is a significant factor associated with short birth interval less than 36 months. In our study women reside in rural area were more likely to practice short birth interval compared to women in urban areas. The finding of this study shown that women in rural area are three times more likely to practice short birth interval compared to women in rural areas AOR=3.019 95% CI (2.038-4.471). This finding is supported by study conducted in Southern Nations, Nationalities and Peoples Regional State that women in rural areas were 2 times more likely to practice short birth interval than women in urban area(20). This finding is in line with recent studies conducted in Borena(8) that women in rural area practice short birth interval than women in urban areas. This might be due to women in rural areas have different life styles and lack of access to infrastructures, public institutions and employment.

Among the socio demographic factors, type of marriage was associated with short birth interval. Result from this study show that women in husband's marriage of monogamy were more likely to practice short birth interval than women in husband's marriage of polygamy AOR =1.47 95%CI (1.08- 2.18) this likely is due to the fact that the time difference husband spent in polygamous and monogamous marriage. Sex of the index child was among socio demographic factors associated with short birth interval. In this study being daughter of preceding child was associated with short birth interval. Women with daughter index child were 3 times more likely to practice short birth interval than male index child. AOR=3.631 95% CI= (2.514-5.242). Proportion of short birth interval when immediate preceding daughter child was 61.4% and 36.8% for the immediate preceding male child. Our finding reinforces previous cross sectional case control study in pastoralist community of Borena shown that being daughter of the sex of index child was associated with short birth interval. High proportion of short birth interval (61% of short birth interval when the sex of index child was female and 42.4 % when the sex of index child was male (8). Cross sectional study in southern Ethiopia shown that proportion of short birth interval for sex of female index child was 59.8% and 55% for the sex of index child was

male(20). This might be due to preferences to sex in different cultures and social values to male. This finding was in line with the above studies in Borena and southern Nations, Nationalities and peoples Region (8,20).

Study in India, Manipur show that birth interval is long when immediate preceding child is son (2). Demographic study in Egypt show that being daughter of preceding child was associated with short birth interval(37). The length of birth interval of the women whose previous child is male is longer than that of those whose previous child is female. It may be due to the fact that parents put typically highly value on son since it is treated as an economic asset and old age assurance as well as the bearer of family name (2). Our study is in line with studies in India and Egypt ,but not in line with study in Mozambique shown that birth interval was short when the immediate preceding child is male(30).

Duration of marriage was among the factors which associated with short birth interval in this study. Women with duration of marriage of less than 15 years were more likely to practice short birth interval compared to women with duration of marriage greater than 15 years. AOR=1.28(1.22-3.02)

Proportion of short birth interval for duration of marriage less than 15 years in this was 80% and 20% for duration of marriage greater than 15 years. This might be due to women with short duration of marriage might have an intention to achieve desired number of children and family size in their fecundity period. Demographic research in Egypt (37)show that duration of marriage and first birth are associated with short birth interval.

Number of children woman had was significantly associated with short birth interval. Proportion of short birth interval for women with less than three children and greater than three children was 78% and 22% respectively. Women with 3 children and less were more likely to practice short birth interval compared to women with 4 children and above. Women with 3 children and less were 2 times more likely to practice short birth interval AOR = 1.8 95%CI (1.158- 3.07).Study in Mozambique show that woman with a few children practice short birth interval. This might be because women are likely to have child for variety of reasons such as greater fecundity and being early on in the family building process, those who have suffered a pregnancy or child loss are more likely to replace that pregnancy or child and hence the interval between births is short. A



second explanation is related to the fecundity factors women who conceive easily and quickly are also those who are more likely to have more children. Shorter birth intervals for those who have few children and longer intervals for those who have a moderate number of children.(30).This study could have limitations in misreporting of death, recall bias and information bias in case of reporting age of both mother and children in households with no birth certificate. Therefore readers should consider these limitations.

## **Chapter seven**

### **Conclusion and recommendation**

This study revealed that length of birth interval in the study area was short. High proportion of short birth interval among women of age group 25-34years. Place of residence, duration of marriage, number of children living in house hold, sex of index child and type of husband's marriage were factors associated with short birth interval in the study area. Intervention should be taken to decrease the prevalence of short birth interval and Promotion of optimal birth interval is needed in the study area. Promotion on fertility control programs and prolonging interval between births should be focused in study area to decrease health risks related to short birth interval. Education on benefits of practicing optimal birth should be considered in health related programs in the study area.

1. Mareka woreda health office should work to reduce high prevalence and practice of short birth interval.
2. Dawuro zone Health Department and together with local media to create awareness on risks of short birth interval and benefits of optimal birth interval among women in the study area.
3. Integrated Family Health Program (IFHP) should work both with Mareka woreda and Dawuro zone health department to promote optimal birth interval in the study area.
4. Further study is needed to identify other correlates of short birth interval in the area.

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## Annex 1

### Questionnaires

Questionnaire on birth interval and associated factors among married women in Mareka woreda, February 2014.

#### PART I SOCIO DEMOGRAPHIC VARIABLES

S .no	Question	Responses
101.	How old are you?	----- Years.
102	What is your religion?	1. Orthodox 2. Muslim. 3. Protestant. 4. Catholic

		5. Others (Specify)-----
104	What is your ethnicity group?	1.Dawro 2.Amhara 3.Konta 4.Wolayita 5.kaffa(Minjo) 6. Others (Specify)-----
105	Type of marriage	1. Monogamy 2. Poly gamy
106	Place of birth of the index child	1.Home 2.Health post 3.Health center 4.Hospital
107	Have you ever attend any formal schooling?	1.Yes 2.No(skip to Q111)
108	What is the highest grade of school you completed?	1. Illiterate 2. Basic education 3. Elementary education 4. Secondary education 5. Institute and college
109	Respondent's place of residence	1. Urban 2. Rural
110	Are you living near your mother in law?	1.Yes 2.No
111	Are they dependant on your family?	1.Yes 2.No
112	occupation	1.Government employee 2.Merchant 3.housewife 4 ,others specify-----
113	Apart from house hold duties such as	1. Yes

	cooking, rearing children etc. Do you have any other work?	2. No. (skip to117)
114	What kind of work do you do?	-----
115	Whom are you working for?	1. Self employed 2. In a family business 3. Government employee 4. Others (specify)-----
116	If government employee, how many hours you spend in work?(hour)	1.6 hours 2.8 hours 3.12 hours 4. Others (specify)-----
117	Do you do this work at home or away from home?	1. At home 2. Away from home
118	How long have you been doing this work?	----- Years
119	How much are paid for your work?	----- Birr (if in kind estimate the value of goods.
120	Availability of media equipments?	1. Radio 2. Television
121	Monthly house hold income in ETB?	-----
122	source of income	1. Agriculture 2. Live stock 3. Others (specify)

<p><b><u>PART II FERTILITY</u></b></p> <p>The following questions are about the total number of children that a mother born Irrespective of their survival status.</p>		
201	How many children have you ever born alive?	1. Boys -----

202	How many of these children are living with you?	-----
203	Is the index child living with you?	1.Yes 2.No
204	How many of these children are living elsewhere?	-----
205	Have you ever given birth to any children who died later?	1. Yes 2. No
206	How many of your children died?	-----
207	If dead, for how long did the child live?	----- Month
208	Have you given birth to any child during the last 12 months?	1. Yes 2. No
209	Sex of the child	1. Male 2. Female
210	Additional people in household?	1.Yes 2.No
211	Age since first birth	-----years
212	Ideal Child spacing norm	1 .1year 2.2-3 years 3.4-5 years
213	Ideal number of children	1.2children 2.3children 3.4 children 4.>4 children
214	Ideal women's age at onset of child bearing	1.15-18 years 2. 19-22 years 3.23-26 4.>26 years



125	Duration of marriage	-----years
126	History of Pregnancy wastage	1.yes 2.No

**Part III Birth History**

Now I would like to ask you about the history of all of your births, whether still alive or Not starting from the first you had.

301 Birth Order	302 Sex 1. Male 2. Female	303 In what month and year did (name) born 1 Year 2 Month	304 Is he /she Alive? 1. Yes 2. No	305 How old was (name)he/she died 1-----year 2----- Month
1				
2				

**Part IV Breast feeding Practice**

	Name of last child----- Birth Order -----	Name of child next to last----- Birth Order-----
<b>401</b> Did you breast fed (Name)?	1. Yes 2. No	1. Yes 2. No

<p><b>402</b></p> <p>How long was (name) Breastfed?</p>	<p>1. &lt;5months 2. 5-10 months. 3.10-15 months 4.15-20 months 5.&gt;25 months</p>	<p>1. &lt;5months 2. 5-10 months. 3.10-15 months 4.15-20 months 5.&gt;25 months</p>
<p><b>403</b></p> <p>Reason for stopping breast feeding?</p>	<p>1. The child being old enough 2. New pregnancy 3. the mother was sick 4. other(specify)</p>	<p>1. The child being old enough 2. New pregnancy 3. The mother was sick 4.other(specify)</p>
<p><b>404</b></p> <p>When do you think breast feeding should stop Completely?</p>	<p>After ----- months.</p>	<p>After ----- months.</p>

<p><b><u>Part V. Knowledge and practices about modern Contraceptive Use</u></b></p>		
<p>501</p>	<p>Have you ever heard of Family Planning methods?</p>	<p>1. Yes 2. No</p>
<p>502</p>	<p>Do you know any method that women and men can use to delay or avoid Pregnancy?</p>	<p>1.Yes 2.No</p>

503	Partner approves of contraception?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> <li>3. Don't know</li> <li>4. Did not answer</li> </ol>
504	Contraception use decision maker?	<ol style="list-style-type: none"> <li>1. Man</li> <li>2. Woman</li> <li>3. Both</li> <li>4. Don't use contraception/Do not answer</li> </ol>
505	Which of the following methods do you know about?	<ol style="list-style-type: none"> <li>1. Pills</li> <li>2. Injectable</li> <li>3. Condom</li> <li>4. Norplant</li> <li>5. IUD</li> <li>6. Other (specify)</li> </ol>
506	Are you using any of the method?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
507	What is the purpose if you are currently using contraceptive method?	<ol style="list-style-type: none"> <li>1. Birth spacing</li> <li>2. Limiting birth</li> <li>3. Other (specify)</li> </ol>
508	If your answer for question 506 is yes please, mention its name	-----
509	If you were not using any contraceptive method to delay or avoid pregnancy, would	<ol style="list-style-type: none"> <li>1. Desire for more children</li> <li>2. Healthcondition( fear of side effects)</li> <li>3. Religious reason</li> <li>4. Moral and cultural</li> <li>5. Lack of knowledge of Contraception</li> <li>6. Family Planning service not available</li> <li>7. Other (specify)</li> </ol>

**Part VI Marriage and Sexual Activity**

601	Are you currently married or living together with a man as if married?	1. Yes, currently married 2. Yes, living with a man. 3. No, not in union
602	Have you been married or lived with a man only once or more than once?	1. Only once 2. More than once
603	In what month and year did you start living with your husband/partner/	-----

**Part VII Husband Information**

701	Age of husband	-----years
702	Has your husband attended any formal schooling?	1. Yes 2. No
703	The highest grade completed by your husband?	1. Illiterate 2. Basic education 3. Elementary education 4. Secondary education 5. Institute and college 6. Other (specify)-----
704	What type of work does your husband do most of the time?(occupation of your husband)	1. Daily laborer 2. Government employee 3. Merchant

		4.Unemployed
705	Is he paid for his Work?	1. Yes 2. No
706	How much income does he bring to the house hold per month?	-----Birr (if in kind estimate the value of goods
707	Type of profession	1.Teacher 2.Agricultural agent 3.Health professional 4.Others (specify)-----
708	Do your husband discuss with you in family planning issues?	1.Yes 2.No
709	Do your husband lives near his family?	1.Yes 2.No
710	Does your husband follow mass media (radio, TV)?	1.Yes 2.No
711	Availability of live stock in house hold?	1.Yes 2.No

**YELETHA GIDDONI D7IYA ADUSATHETHANE GAKEETHEDABATA  
OCHANWU GIGEEDA OSHAA, MARAKA WORADAA .USUPUNNIYA  
2014 M.L**

**1<sup>ro</sup> bagga**

Qoo dda	Oshawuwa	Zaruwa
101.	Yeletalayitha?	----- layitha.
102	Amanoyiyibe?	Orttodokisiya-----1 Islaama-----2 Penxiiya-----3 Kattolikiya-----4 Harra/gijeta----88
102	Yaraiyabee?	1.Dawrowaa 2.Kontaa 3.Wolayitaa 4.Kaffaa(Manja) 5. Harra/guijete----88
103	Gellewamarra	1.Itti mache

		2. Dawutha
106	Yelotamarra	1.Manitiya 2.Iiti na7a
107	Wursetha na7ayi yelotosohoyihaqee?	1.Soyana 2.Tena kellana 3.Tena xabiyana 4.Hospitaliyana
108	Xsaafanwunenababuwadandayayi?	1.E7ee 2.Dandayike
109	Timrtiyattamaraeradi?	1. E7ee 2.Tamara erike(111 oshakoadha)
110	TamaredagidoppeAffunthawursadi?	2. Masratetimritiya 3. Koyirodetha 4. La7entho detha 5. Hezanthadetha 6. Harra (yota).....
111	De7iya sohuwaa	1. Araadani 2. Gaxariyani
112	Bolotenaitippe de7ayi?	1.E7ee 2.Hakoo sa7ani de7aiy
113	Nee bolotiyabarenaadandayedani/cimabekee	1.Ee7 barenadandaedano 2.Cimadu
114	Ossowuakomo	1.Astamare 2.Payetetha ossancha 3. Hara(gijaa)
115	So ossouppharabaothiyawenewu de7i?	1. E7ee 2. Bawa. ( oshaqodaa 121 adhaa)
116	De7oppe ayimalaosse?	-----
117	Ossiothayi?	1. Tassiothayiothayi 2. Daboassasiothayi

		3.Kawossi othayi
118	Kawoossanchagidoppeappusatiyaossonip eshayi?	1.6 sate 2.8 sate 3.12 sate 4.Hara Dee7opee (gujaa)-----
119	Ha7a                    ossowa                    so7oni othayiwoyikokareniothayi?	1. Soyani 2.Kareni
120	Ha ossowuadomodepeappuewode?	-----
121	Woyisayiccigeti?	----- Birrani
122	Ne soyaniWoriyasisyamishayi de7i?	1.Irradoni 2.Telvizhini
123	Aginanidemiyabiraawoyikomisha	-----
124	Birrademiyaqotayiyabee	1.Goshasha 2.Miya harrow 3.Hara (ode)

<b>2<sup>tho</sup> Yeletetha Kali de7iya shay so Guidonia de7iya natowagaketeda</b>		
201	Ne layithanaffuna nana yeladi?	1. Attuma -----. 2.Macca-----
202	Appunaninena de7i?	1. Attuma -----. 2.Macca-----
203	Wursetha na7iyi nena de7i?	1.E7ee 2.Bawa
204	Ubananapeappunuunenana dee7i?	1. Attuma -----. 2.Macca-----
205	Yeliti gami7idi hayo nana dee7i?	1. E7ee



		2. Bawa
206	Appunanayinepehayqede?	1. Attuma -----. 2.Macca-----
207	Issilayithgidoni nana yeladi?	1. E7ee 2. Bawa
208	Matumayiyibe	1. Attuma -----. 2.Macca-----
209	Hayqedagidoppeeappuwodiya gami7ede?	----- agena
210	Soogidonigujaasayi de7i	1. E7ee 2. Bawa
211	Ne assinagelossappeappunlayithe?	-----layitha
212	Assina ne gelodenuwuappunlayithee?	-----layitha
213	Machaassayiappunlayithanyeluwadomi yako lo7oo gay?	1.15-18 layitha 2. 19-22 layitha 3.23-26 layitha 4.>26 layitha
214	Apunnatinessiyeletiyako lo7oo?	1.2 nanayi 2.3 nanayi 3.4 nanayi 4.>4 nanayi
125	Nana appunlayithaadusathethanyeliyako lo7oo gay	1 .1 layitha 2.2-3 layitha 3.4-5 layitha
126	Neppeshaharybayierri?	1. E7ee 2. Bayierenna

301 Yellwuamara	302 matuma 1. Mcca 2. Attuma	303 Ayaagenani nelayithani (suntha) yelethed	304 Hayiqede/paxaa de7i 1. paxa 2.Hayikeda	305 Appunwodiyanhayede 1-----Layitha 2----- Agena
1				
2				
3				
4				
5				
6				
7 <sup>+</sup>				

<b>4<sup>tho</sup> Tantuahanotta</b>		
	Wuresthanasuntha----- Yelehemarra -----	Wurestha nape bayirayiya na7a sunthayionne Yelehemarra-----
<b>401</b> Ne na7a---tantadi	1. e7ee 2. thantabeke	1. E7ee 2. Thantha bike
<b>402</b> Woyisakenawodiyathanth adi?	1. <5 aggina 2. 5-10 aggina 3.10-15 aginna 4.15-20 aginna 5.>25 aginna	1. <5 aginna 2. 5-10 aginna 3.10-15 aginna 4.15-20 aginna 5.>25 aginna

<b>403</b> Thanthenanaagedabagidof egassuayibe?	1.Na7ayi banadandayogishasa 2. Harashaharedagishawu 3.Attifayathethanagayitedam etuwana 4. Haraguja	1. Na7ayi banadandayogishasa 2. Hara shaharedagishawu 3.Attifayathethanagayitedametuwana 4. Hara guja
<b>404</b> Nana thantethayayideeqanakosh esi gay?	----- aginappeeguyian	-----aginappeeguyian

<b><u>5<sup>tho</sup> bagga so assahalchuaEraranehannotanagayitedaoshatuwa</u></b>		
501	So assahalchuwamadiayaogetasissaerayi	1. Sissadi 2. Sissabike
502	Atumaassasgidinmaccaassasyeluwateqanawumadiyaogetahpeeri yawe de7i	1.E7ee 2.Bawa
503	Neassinayyeluwatqanawueketiyaxaliyaneneekanadanmayii?	1.E7ee 2.Mayena 3.Erike 4.Osha zarike
504	Yeluwateqiyaxaliyaekanadanwoyikoekenadanawatiyagionne?	1.Assina 2.Maccasiwu 3.L7atu maqetidi 4.Yeluwa teqiyaxaliyaekaerike
505	Yeluwateqiyaxaletuppehaqawqntaherrayi?	1. Mithetiyakiriniya 2.marfiyan emetiayawa 3. Condomiya 4.Hashiyanxapponigeliy awa

		5.Mahetaniyagiddoniuth iyawa 6. Haray de7oppe guja
506	Hagapebolara de77iya yeluwateqiyaogetuppeneneiekaerayi?	1.Eka erayi 2. Ekaerike
507	Ha7i ekayida de7oppe ekisiyabayiyibe	1.Nana hassayelanasi 2. Yeluwaessanasi 3. Hara gasoyi de7oppe guja
508	Qoddapayidua 504 oshazaroyi e7ee gidopeayiqomoyeluwateqiyaogetherayi?	-----
509	Ayiqommoyeluwateqiyaoagiyaekenagagidoppeyeluwateqanawua yawuekeiki.	1. Nana koyiyagishawu. 2.Fayathethanagayitedag ishawu. 3.Amanunagakethedaga suwan. 4.Wogaragakethedabatu n. 5.Yeluwateqiyaogethaer enagishasi 6.Yeluwateqiyaogetiher anbayinagishan. 7. Harayi de70ppe guja!

<b><u>6<sup>tho</sup> bagakarranegakeththanaoshotha</u></b>		
601	Ne koyrogeledaassinara de7ayi?	1. E7ee geladi 2. E7ee koyiroassisnara de77ayi. 3. Itippe de70ko/shaketedo.

602	Koyirogeledaaasinadhalara de7ayi	1Itwu tallageladi 2. Ituwapeedarageladi
603	Appunilayiteneasinara de7uwa domadi.	Layitha ----- aginna-----
604	Ne assinara de7uwa domossapheappunlayita.	-----Layitha
605	Koyiroashuwagakethethadomosapheappunlayithe?	1. Atuma asana gaketabeke 2. -----Layitha
606	Assinagelanappekaseatumaassagayitaerayi?	1. E7ee 2. Dena 3. Erike
607	Atumma asana gaketossappeappunwode	-----gala?

<b>7<sup>tho</sup> bakaassinaosha</b>		
701	Yeletalayitha	-----ylayitha
702	Ne assinaytamarede?	1. E7ee 2. Tamaribena
703	Appunagakanawutamarede?	1.Masaraearatimatimirtiya 2. Koyirodetha 3. La7antho dethatimirtiya 4. Hezanthodetha 5.Hharaguja
704	Ne assinayiubakalaothiyoosoyiyibe?	1. Gala ossancha 2.Kawoossancha 3.Zalancha 4.Ossobayinaga
705	Ne assinaossuwasciiggetti?	1. Ee7ee 2. Ciggettenaa
706	Aginaniwoyisakenabira demi?	----- Birra(birragidenanexoppeharabagimitiyanii) zarisa
707	Ossuwaqomoyi	1.Astamariya

		2.Gosha ossancha 3.Fayathetha ossancha 4.Hharayi de7oppe gujja
708	Nekethawayinenarayeluwateqethabatunmaqetie rri?	1.E7ee maqete 2.Maqeti erena
709	Ne kethawayiba so assamiyani de7ii/	1.E7ee 2.So assamiyan de7enna
710	Ne assinayitelevizhinyaxellieri?	1.E7ee xelessi 2.Xelenna
711	Ne assinassonimiyayi de7ii	1.E7ee de7ee 2.Bawa

## ANNEX 2

### Consent form

JIMMA UNIVERSITY, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES  
DEPARTMENT OF EPIDEMIOLOGY AND BIostatISTICS

Consent form prepared for the study to investigate birth interval and associated factors among married women in Mareka woreda, Dawuro zone, south west Ethiopia, February 2014.

#### DESCRIPTION OF CONSENT FORM

This consent form is prepared to inform the objective of study on birth interval and associated factors to women and thereby to participate them in the study.

Good morning /good afternoon! My name is------. I am post graduate student from Jimma University and currently working as a data collector on birth interval and associated factors among married women in Mareka woreda. The objective of this study is to investigate factors affecting birth interval among married women in Mareka woreda and to participate women actively in responding to the questions regarding socio economic,

demographic and reproductive behaviors affecting birth interval and to inform mothers on benefits and risks associated to length of birth interval, to increase favorable attitude and knowledge regarding birth interval, design effective interventions after the study. Your active participation is very important for our study. The questionnaire may take 10 to 20 minutes. To keep confidentiality of your information, your name will not be registered in this questionnaire. Your responses will be used only for the objective of this study and will not be disclosed to others and will not be used for other purposes. You have full right to withdraw from the interview and not to respond questions you do not want to respond.

Are you voluntary to participate?

Thank you for your cooperation.

Name of kebele-----

Code of kebele-----

Date of interview-----

Name of data collector-----signature-----

Name of supervisor-----signature-----

DAWUROTHUWAA BIRSHETHAA

JIMMA UNVURSIYAA DERETHETHA FAYATHETANEE HAKIMETHETHAA SCINISEE KOLOJIYAA

OSHAWU MAYO WARAQATHAA

DugeehaToppiyan, Dawurozoniani,  
Maraqaworadanninatuuiddonide'eeyayeletsaadusaatsetapilqixelanawugigeeddaoshawuennoya  
awaraqatha. 2005 M.L

Oshawuennoyaawaraqathaabirshetsa

Ha ooshaeenoyawarak'atayimac'ac'aasatusipilk'ethak'offaodanawunemac'ac'assati ha  
pilkethaniwalakethanwugigeeda.

Lo7oo aqqedithee/Fee7dithee. Ta sunthayi-----

TanniJimmaauniversityaani la7antho digriyatamaregidayidamaraqaaworadanii la7uu  
nathuyelethagiddoni de7iya adusathethaapilkethannioshishayis. Ha pilqethassihuphee qofayi  
la7uu natthuugidonni de7iya  
adusathetharagayithedabapilqixelanawunee pilqethappebetiyaerraayetussiqonchisanssa. Ha  
oshanikkaayetuu yeletholayitha, natuqodayi, yelethagiddoni de7iyaa adusathetharagayitheda  
herabatha, de7oone mararagayithedaba aqofanamelatiyabaa,

Ha oshayineoshappebetiyaerraaya yeetuyelethetaragayitidi de7iyaa go7anne  
qohiyabaabollierraasaanawunemethothabilanawu made. Enthe ha  
pilqiixelethanniwalaketussayinuossuwassikehippemade. Entheenussiemi yazaruwaa ha  
pilqethappeharabassi go7eethoko. Entee  
nussiodiyabayiharaassasierethenadanienteesunthayixafethena. Ha  
pilqethaanniwalakethenawwuxanawunee oshaazarenaniexanawu mule mathayi de7ee. Ha  
oshayilatamappebidii oy dutammudaqiqaakakanawubethanawu danda7ee.

Oshaniwalakethanawumayithe?

Enoogishawukehipegalathethoo.



Qabaliyaasunthaa-----

Qabaliyaamalataa-----

Oshaagalassa-----

Ochedawaasuntha-----kusheemalathaa-----

Kaliixeledawaasunthaa-----kusheemalathaa-----

**ASSURANCE OF PRINCIPAL INVESTIGATOR**

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Faculty of Public Health in effect at the time of grant is forwarded as the result of this application.

Name of the student: \_\_\_\_\_

Date. \_\_\_\_\_ Signature \_\_\_\_\_

**APPROVAL OF THE FIRST ADVISOR**

Name of the first advisor: \_\_\_\_\_

Date. \_\_\_\_\_ Signature \_\_\_\_\_

