FEMALE GENITAL MUTILATION AND BIRTH COMPLICATIONS, JIJIGA TOWN, EASTERN ETHIOPIA

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Dedication

This work of research is dedicated to my mother, the late W/r Yeshewareg Tarekegn Kassa, who selflessly dedicated her whole life to the educational betterment of her children. May God rest her soul in peace!!

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ABSTRACT

The practice of female genital mutilation (FGM), in one form or another continues to exist in around 40 countries of the world. It is associated with different kinds of health problems which manifest immediately or long after the wound has healed. Health hazards during delivery are among the long term complications of FGM. With the objectives of assessing and comparing the differential occurrence of birth complications among the different types of female genital mutilation, a cross-sectional study using questionnaire was conducted on December 2001 in Jijiga town among 913 women of reproductive age who had their first birth during the last five years.

The proportion of women who were genitally mutilated was 96% with 52% of them undergone the most severe type of FGM – infibulation. The rest 48% of women had undergone either FGM Type I or Type II; i.e., they were genitally mutilated but not infibulated. Episiotomies occurred among 61% of women who were delivering for the first time and 28.1% of women delivering for the second time. The rates of instrumental and cesarean deliveries among the first-time deliveries were 6.6% and 3.1%, respectively; while they were 3.2% and 1.3% among the second-time deliveries, respectively. Among primi-parous women 36.2% reported having had complicated postnatal period; 22.5%, prolonged labour; 10.3%, perineal tear and 9.8%, heavy bleeding. Internal comparison between infibulated and non-infibulated women had shown that there was a significant difference in the occurrence of hemorrhage and postnatal problems. It was concluded that female genital mutilation in general and infibulation in particular were risk factors for the occurrence of birth complications. Collaborative educational interventions were recommended.

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I. INTRODUCTION

Female genital mutilation (FGM), commonly referred to as female circumcision, is one of the deeply rooted, harmful traditional practices that are still prevalent in a number of countries. In spite of the fact that it is taken as cultural or traditional entity, it is a form of violence against girls and women reflecting discrimination against these vulnerable sections of the society. In some countries where FGM is widely practiced, the condition constitutes a major health problem which puts a lot of burden on the already deficient health services (1). In fact it is a major public health problem that damages the lives of more than 74 million women and girls in Continental Africa and adversely affects the development of more than 26 countries (2). It is not known exactly when, where or why the tradition began, but a variety of reasons - sociocultural, psychosexual, hygienic, aesthetic, and religious - are given for maintaining it. Its origin stretches far back in time; it has been practiced in many places around the world (1, 3). Today FGM survives primarily in large areas of Africa among Islamic and non-Islamic population groups. It is also confirmed on the southern part of the Arab Peninsula and is practiced by some Moslem groups in Malaysia and Indonesia in a less damaging form (1, 2).

Both traditional and modern genital surgery is performed in different societies for a variety of medical, cosmetic, psychological or social reasons. However, the surgical procedures included in the context of female genital mutilation/cutting (FGM/C) are limited to cutting rituals performed exclusively for cultural and traditional reasons on girls or young women, often without their approval or full understanding of the consequences of the procedure(4). FGM involves the removal of some or all of the external female genitalia and is usually performed on children by traditional birth attendant, midwives or an old woman who traditionally performs this practice in

the community (traditional circumcisers). The operation usually takes place under unhygienic circumstances and without anesthesia, with the operator lacking the basic anatomical knowledge of the female genitalia and surgical skills. Therefore, it is bound to result in serious complications to the health of the child which can amount to death. Those who are fortunate enough to escape this dramatic complication are left with major disabilities which affect their psychological, sexual and reproductive health in later life (1). Young girls subjected to these mutilations and their mothers have no choice and are not only ignorant of the health dangers involved, but they are also unaware that these operations are unnecessary, have none of the claimed beneficial results for their society and do not exist in most part of the world (2). The reproductive health complications of the practice range from acute trivial hemorrhage through painful sexual life and inability-to-conceive to fistula and death secondary to birth complications such as obstructed labor (1, 2, 3, 4, 5, 6, 7, 8).

The practice of FGM is also rampant in Ethiopia with a national prevalence range of 74 to 85% (4, 9, 10). Almost 100% prevalence rate was reported for the Somali National Regional State (SNRS) in the demographic and health survey (DHS) 2000 of Ethiopia (9).

This study was conducted in line with some of the WHO suggested research areas, published on FGM Overview 1998 edition (4). The purpose of the study is to generate area-specific information on the ill-health effects of FGM in general and infibulation in particular among women living in Jijiga town. It is hoped that the provision of such information that involved women of the area, particularly the Somalis, for decision-makers, who themselves are natives (mostly males); will help in breaking the mute consensus that prevailed in the region. At the same time, it will also remind health planners of the region to visualize the extent of the problem in terms of its significant life-long negative health impacts and special health care needs of victims.

II. LITERATURE REVIEW

2.1. Geographical and Historical Overview

The earliest known writings on the subject suggest that female genital cutting has been practiced in Egypt for at least 2,000 years (10). Writing in the sixth century by a Greek physician praised the Egyptian practice of genital "excision," explaining that unless the clitoris is cut, it will continue to grow and lead to inappropriate thoughts or behavior in young women (2, 10). Several varieties of FGM were carried out in Europe in the past although evidence indicates such operations were not common. Only one group is known, the Christian Skoptzy sect in Russia, which practiced infibulation as a matter of routine (1). Most theories about the origin of genital cutting suggest that these procedures provided a means for families to safeguard the "value" of women, guaranteeing virginity before marriage and the creation of legitimate heirs during marriage. Some evidence also indicates that slave-traders acquired infibulated women or infibulated female slaves because these women - whose labor would be uninterrupted by childbearing - could be sold for higher prices (1, 10). Overall, no definitive evidence exists documenting exactly when and why genital cutting began.

There is also little that can be said with certainty about the origin of different types of FGM. It seems most unlikely that the practice spread initially from any single location. One possibility suggested by Seligman is that FGM in the African and Arabian area are derived from ceremonies enacted by the Hamito-Semitic inhabitants of the Red Sea Coast (1, 2). As for infibulation, its distribution throughout the Sudan-Ethiopia-Somalia region might indicate a relation with the Cushites (1). Although often perceived to be a Muslim practice there can be no doubt that FGM in Egypt, Sudan and Ethiopia dates from long before Islam or Christianity (1, 2).

In general genital cutting occurs primarily in Africa and these practices have also been documented among African immigrant communities in a number of countries. As different researchers point out, however, genital cutting is not a practice historically restricted to Africa. As late as the 20th century, various Western physicians believed that a number of mental and physical "disorders" could be treated through the removal of women's external genitalia (10). In the 1800s, some doctors theorized that "hysteria" and "lesbianism" could be managed by modifying or removing female genitalia (10). During the 19th century there were gynecological surgeons who performed clitoridectomies for allegedly medical reasons which included prevention of masturbation and treatment of nymphomania and frigidity (1).

The type of FGM that involve partial or complete removal of the clitoris and/or the labia minora (excision) is common from the east coast of Africa to the west, from Ethiopia to Senegal, from Egypt down to Tanzania. It is also found towards the southern end of the Arabian Peninsula and along the Persian Gulf. Muslims in Malaysia and Indonesia practice a mild form of genital mutilation as well. Infibulation is widespread in Sudan (excepting the south), in eastern Ethiopia (Ogaden), in Eritrea skirting the Red Sea, in Djibouti, and in Somalia and the adjacent part of Kenya. In southern Egypt infibulation continues as well and cases have been reported from Mali and Nigeria (1).

It is now also practiced in Europe and North America with immigrants from Africa and Middle Eastern countries continuing to mutilate their daughters in their adopted homelands, according to traditional custom.

2.2. Definition and Classification

Controversy still continues to exist over the use of the terms "female circumcision" and "female genital mutilation" to describe the procedures employed. The most common argument over the term "female circumcision" relates to whether or not the procedure is analogous to male circumcision - a practice to which medical literatures has not yet established any sexual or other dysfunction. The procedure has been termed "female genital mutilation", often abbreviated to FGM, because of the severity and irreversibility of the damage inflicted on the girl's body. The term FGM was first endorsed by the Inter-African Committee on Traditional Practices Affecting the health of Women and Children (IAC) during its regional meeting in Addis Ababa (1989) and it is now the term generally accepted for the practice (4, 5, 6). The difference among researchers and health personnel was not only in the use of terminologies but also in the classification of the different types of genital mutilation.

Recognizing the need for a standardized classification and terminologies, WHO, UNICEF and UNFPA gave their joint statement on FGM in April 1997 with the following definition and classifications of the practice (4, 5, 6):

> "Female genital mutilation refers to a group of traditional practices that involve partial or total removal of the external female genitalia or other injury to the female genital organs for cultural, religious, or other non-therapeutic reasons."
>
> Four different types of FGM were identified, type I through type IV:
>
> > *Type I:* Excision of the prepuce, with or without excision of part or all of the clitoris.
> >
> > *Type II:* Excision of the clitoris with partial or total excision of the labia minora.

Type III: Excision of part or all of the external genitalia and stitching/ narrowing of the vaginal opening (infibulation).

Type IV: Includes pricking, piercing or incising of the clitoris and/or labia; stretching of the clitoris and/or labia; cauterization by burning of the clitoris and surrounding tissue; scraping of tissue surrounding the vaginal orifice (angurya cuts) or cutting of the vagina (gishiri cuts); introduction of corrosive substances or herbs into the vagina to cause bleeding or for the purposes of tightening or narrowing it; and any other procedure that falls under the definition of FGM.

2.3. Prevalence and Epidemiology of FGM

The practice of FGM, in one form or another continues to exist in around 40 countries, mostly in East and West Africa, and parts of the Arabian Peninsula (2, 7). The variation in the percentage of adult female population affected by the practice between countries ranges from 5% to almost 98% in most countries of the horn of Africa (2, 6, 8). With immigration, it is now also practiced in Europe and North America. Currently it is estimated that over 132 million women and girls have experienced FGM. It is also estimated that some two million girls are at risk of undergoing some form of the procedure every year (4). About 600 girls are genitally mutilated every day (7).

Worldwide type I and II together account for 80-85% of all FGM, although the proportion may vary greatly from country to country. Only 15-20% of all women who experienced genital mutilation have undergone type III, but in certain countries such as Djibouti, Somalia and Sudan the proportion is 80-90% (4).

In Ethiopia, types I and II are common except in the eastern part bordering Somalia and Djibouti where type III is practiced (4). According to the 2000 DHS of Ethiopia only 3% of genitally mutilated women had had FGM type III (9). In 1984, the MOH together with UNICEF conducted a prevalence survey in five regions - Addis Ababa, Arssi, Eritrea, Goffam and Hararghe - and found that the practice is almost universal in the areas studied although no overall prevalence rates were cited (4). A further study in 1990, sponsered by IAC, included 20 of the 31 administrative regions and found that 85% of the women surveyed had undergone genital mutilation. However, this survey did not include high prevalent regions such as Diredawa, Ogaden and Eastern Hararghe (4).

The National Baseline Survey on Harmful Traditional Practices in Ethiopia, conducted by the National Committee of Traditional Practice in Ethiopia (NCTPE) in September 1997/98, has found a prevalence of 73.6% in the country (10). According to the 2000 DHS of Ethiopia, the overall national prevalence of FGM is 80% with as low as 36% of women in Tigray and as high as 99% of women in Somali and Affar regions having had genital mutilation (9). It goes without saying that with such alarming prevalence (and associated health consequences); it is a major public health problem in the country.

The age at which FGM is performed varies widely, depending on the ethnic group and geographical location. In some groups it is performed on babies; more commonly it is undertaken between the ages of 4 and 10 years but it may also be carried out in adolescence or even at the time of marriage or during a first pregnancy (6). Among the countries in which FGM is performed during infancy are Cote d'Ivoire, Eritrea and Mali but the median age for these countries are 9.7 years, 6.3 years and 1.8 months, respectively (11). A study in eastern Ethiopia

has shown that the Adere and the Oromo perform FGM on girls aged 4 years to puberty, while the Amhara perform it on the 8th day following birth (12); another study in Axum area (northern Ethiopia) reported 12th day (13). Nomadic Somali women excise the clitoris and labia on most girls aged 4-8 years (14) and a mean age at genital mutilation of 6.9 years with a range as high as 15 years was also found among women living in southern Somalia (15).

Operations are usually undertaken by an elderly woman in the community specially designated for this task (traditional circumcisers) or by traditional birth attendants, although in some cases, health personnel such as midwives and doctors are involved (6). In Egypt and Sudan a substantial number of the procedures are performed by medical professionals (11). The trend toward medicalization of genital cutting appears well underway in Egypt, with mothers increasingly opting to have their daughters operated on by doctors. Among Sudanese women, where infibulation is the most common procedure performed, trained midwives are often the provider of choice. However, traditional practitioners are the most common operators in most African countries (2,6,11). In the 2000 DHS of Ethiopia, it was shown that more than 97% of women had been genitally mutilated by traditional circumcisers and traditional birth attendants.

The findings from the 1997 Demographic and Health Surveys Program of seven countries (Central African Republic/CAR/, Cote d'Ivoire, Egypt, Eritrea, Mali, Sudan and Yemen) has showed that genital cutting occurs among all socioeconomic group, prevalence levels are often higher among Muslim women, attitudes and practices vary considerably by ethnicity, the daughters of urban and educated women may be less likely than others to undergo genital cutting, support levels are higher among Muslim respondents and women in high prevalence countries, and no major decrease in prevalence levels is evident across generations (11).

In countries with high prevalence levels (≥ 89 percent) there are no substantial differences in levels of cutting among women based on education or residence. For instance, prevalence among Egyptian women with some secondary education is 91%, compared with 100% among those with no education. Similarly, the difference between urban and rural women is small, with prevalence levels of 94 and 100 percent, respectively. In CAR and Cote d'Ivoire, countries with lower prevalence levels, families that educate their daughters do appear less likely to adhere to the tradition of FGM. In both countries, prevalence levels among women with at least some secondary education are 23% compared to 50% among women with no education. In all seven countries studied, urban women are not substantially less likely to have undergone FGM than their rural counterparts. A community based study in Somalia has shown that education, ethnicity and economic status had no influence on the performance of female genital mutilation (16).

The findings of the 1997 DHS Program and other small scale studies also showed that tradition/custom and religion are the most common reasons given for supporting and practicing FGM, and medical complications are the most commonly given reason for opposing the practice (1,2,8,11,15).

2.4. Health Consequences of FGM

All types of female genital mutilation involve removal or damage to the normal functioning of the external female genitalia and can give rise to a range of well documented physical complications. They are irreversible and their effects last a lifetime.

The occurrence of physical complications depends on several factors, including the extent of cutting; i.e., the type of mutilation, the skill of the operator, the cleanliness of the tools used and

the environment, and the physical condition of the girl or woman concerned (4). Another factor related to the occurrence of complication is the timing of FGM as this may affect childbirth outcome since FGM performed antenatally may precede labour and delivery by only a few days or weeks, whereas FGM performed on neonates or in childhood will precede labour and delivery by many years (17). Although serious complications are possible following all types of FGM, those resulting from type III occur more frequently, tend to be more serious and last longer (1,2, 3,4). However, the same picture of mechanics (obliterated vulva) can occasionally follow types I & II due to infection and inflammation at the time of mutilation leading to vulval adhesions which effectively narrow or completely obliterate the vaginal opening (17).

The procedure is generally performed outside the health care system and commonly results in potentially serious, short-and long-term complications. Among the long-term/late complications are those occurring before, at and/or after delivery, affecting the health of both mothers and children. These complications are typical of FGM type III as a result of the mechanical obstruction caused by the scarring covering the urethra and vagina, and further damage caused by defibulation and by "re-infibulation" (2, 4).

During childbirth, the infibulated woman must be defibulated to allow the fetal head to emerge from the vagina. This increases the risk of complications of labor and delivery such as bleeding, perineal tear and wound infection. Case reports are abundant in the literature to show that female genital mutilation is a cause of reproductive morbidity (4) and most of the earlier studies that related FGM with negative birth outcomes were either case reports, case series or observational series (17). Cases of ruptured vulval scar, perineal tears, fetal distress and vesicovaginal and vesicorectal fistulae have been reported (18). There have also been reports of severe lacerations,

including third-degree tears involving the anal musculature and injuries to the urinary tract including avulsion (tearing away) of the urethra from the bladder (19).

One well documented study was undertaken by De Silva in 1989 on 173 mostly infibulated Sudanese women living in Saudi Arabia and delivering in a well-equipped hospital (20). His findings included significant delay in the second stage of labour, increased hemorrhage and increased occurrence of severe fetal asphyxia. There was no increase in maternal or neonatal mortality. Another study by the same researcher in the same setting among 167 Sudanese women with FGM (compared to a control group of 1990 women without FGM) showed that the duration of the second stage of labour was prolonged for primips at greater than 90 minutes and multips at greater than 60 minutes, with statistical significance at $p<0.001$. There was no difference found in the duration of the first stage of labour for the women with FGM and those without FGM. FGM types I, II and III were represented in the FGM group in this study (17).

Shandall in 1967 in Sudan had described five cases of prolonged labour (all with FGM Type III) in a series of 1245 obstetrics patients seen over five years, where the tough obliterated vulva obstructed the fetal head. The author stated that FGM Type I did not appear to interfere with childbirth in any way (21). El Dareer in Sudan in 1983 and Odujinrin in Nigeria in 1989 had both demonstrated in their study which involved interview and clinical examination that women would reject FGM because of or had awareness of FGM causing difficulties in childbirth (22, 23). However, the study by Ebong in Nigeria in 1997 to assess views on health hazards of FGM showed only 10 of 400 respondents believed FGM (probably Type II) could prolong labour and cause stillbirth, which seemed to illustrate either little awareness among respondents of the effects of FGM on childbirth or a denial of the negative effects (24).

In a UNESCO survey of 859 women in Lower Juba in Somalia during 1993 to investigate understanding of and attitude to FGM, it was found that 558 (65%) women who cited negative aspects of FGM stated that childbirth and the problems caused by FGM was one of their main concerns. Of the women interviewed, 98% had undergone FGM Type III in childhood (25).

In an earlier review study by Renaud et al in 1968 in Ivory Coast it was observed that the length of the second stage of labour in women with mainly FGM Type I/II was the same as in women without FGM. However, intervention with an instrumental delivery was reported in the study in all labours where pushing had been going on for more than 30 minutes. Thus the rates of instrumental delivery were stated to be twice as high in those women with FGM than those without FGM (17). This suggested some degree of delay of the second stage of labour for those women with FGM Types I, II or III. As a summary it can be said that the prolongation of labour described by these studies are related to soft tissue dystocia and many cases of such obstruction are described as being easily overcome by episiotomies (17). The delayed labour relates to the second stage of labour only.

Episiotomies and perineal tears are by far the most common complications reported and there is substantial evidence to show that women with FGM suffer more perineal damage as a result of delivery than do those without FGM (17).

Berardi et al, in a case control study (17), in 1985 in France described a significantly increased episiotomy rate among primips with FGM Type II (89%) compared to primips without FGM (54%) at $p<0.001$. There was significantly increased ($p<0.001$) perineal tear rate in women with FGM among both primips and multips: primips with FGM Type II (11%) compared to no FGM

(3.8%) and multips with FGM Type II (23%) compared to no FGM (3%). Another comparative cross sectional study by De Silva (17,20) in Saudi Arabia in 1989 has also shown a significantly higher rate of posterolateral episiotomy for primips and multips with FGM Type II compared to the women with no FGM ($p<0.05$). Anterior episiotomy (decircumcision) was performed in 91% of primips and 85% of multips with FGM. Perineal tears were experienced by 9% of multips with FGM compared to 1% of multips without FGM (p value not stated). However, none of the primips with FGM experienced perineal tears presumably because all had had posterior episiotomies and a high proportion had also had anterior episiotomies. Aziz in 1980 reported that in a study of 7505 Sudanese women, 99.9% with FGM Type III, the vulva of every genitally mutilated woman had to be cut to allow delivery of the fetus (26).

De Silva in1989 provided strong evidence that FGM leads to a higher incidence of postpartum hemorrhage (17, 20) in his study among Sudanese women in Saudi Arabia. He showed that 5.4% of multips and primips with FGM (Types I, II and III) had postpartum hemorrhage compared to 1.6% of no FGM women ($p<0.001$). This finding is supported by other studies (17, 21, 27).

Postpartum genital wound infection was also found to be more common among women who had had genital cutting than those without the cutting (17, 21, 28).

A health institution-based study in Burkina Faso and Mali has shown that uncut women were significantly less likely to have an observed complication during delivery than were cut women – 5% versus 18-36% (29). An unpublished report cited in the above study from Mali suggests that women who have undergone FGM are nearly seven times more likely than those who have not to experience complications during child birth.

Unfortunately most studies conducted in Ethiopia on female genital mutilation were on prevalence and epidemiology of the practice and it was not possible to get a single study related with birth complications. Moreover, there is no citation of such studies in Ethiopia in the systematic review of the health complications of FGM done by the department of women's health of the WHO.

2.5. Rationale of the Study

Although the prevalence of FGM is exceedingly high in the region and the literature clearly shows the negative health consequences associated with it, the regional health bureau and other related sectors responsible for the health of the people of the region appear to have opted for a conscious silence reflected by the absence of any visible anti-FGM initiatives.

Hence, this study is expected to demonstrate the ill-health effects of FGM among women of the region, particularly Somalis, so that by providing area-specific information for decision-makers, who themselves are natives (mostly males); it will help in breaking the mute consensus that prevailed in the region. At the same time, it will also remind health planners of the region to visualize the extent of the problem in terms of its significant lifelong negative health impacts and special health care needs of victims. The study will also be a contribution, however small, to fill the deficiencies of such studies in the country.

III. OBJECTIVES

3.1. General objective

- To assess the occurrence of FGM and birth complications among women of reproductive age groups (15-49 years) in Jijiga town

3.2. Specific objectives:

1. To describe the prevalence of FGM in Jijiga town.
2. To examine the determinant factors associated with FGM in Jijiga town.
3. To assess the health problems related to FGM during delivery.
4. To assess and describe the rate of complication with regard to type of FGM.
5. To describe and compare the extent and pattern of obstetric complications between women with FGM Types I/II and Type III.

IV. METHODOLOGY

4.1. Study Area and Period

The study was conducted in Jijiga town – the capital of the Somali National Regional State (SNRS). SNRS is located in the most eastern region of the country inhabited by more than 4.5 million people (projected from the 1997 census for the year 2001) that reside over an area of 375,000 Km^2 with a population density of 9.2 persons per Km^2. The weather is hot most of the year. Over 90% of the population is pastoral-nomadic, ethnic Somali with more than 98% practicing Islam. Economic activities are bound up with mobile lifestyle and livestock. The region has extremely poor health status when compared to other regions of the country. Infant and under five mortality rates are 96 and 139 per 1000 live births, and maternal mortality rate is exceedingly high. Crude birth and death rates per 1000 population are 37 and 11.2, respectively. The average number of children per women is about six (30).

Health infrastructure is extremely underdeveloped with only four hospitals, 10 health centers, and 78 health stations. Even these health institutions are mal-distributed, ill-equipped, understaffed and most are in poor state of repair. As a result of these and other regional factors the health service coverage is very low, estimated at 22% in 1999/2000. The government is the major provider of health services. Morbidity and mortality patterns are generally characterized by high prevalence of infectious and parasitic diseases, malnutrition and obstetrics/gynecological disorders (31).

Jijiga town is located some 628 Kms east of Addis Ababa in Jijiga zone, one of the nine administrative zones of the region. The population of Jijiga town is projected to be around 72,585

in 2001 and 62% of them are Somalis. Jijiga town has two woredas and six kebeles. Each kebele is further divided into 4 to 6 ketenas (sefers). There is pipe water, electricity, land and air transportation, and telephone services in the town. Additional communication facilities regularly available are radio, newspapers, and television. One referral hospital and a health center provide health services to the town population. There is also one maternal and child health (MCH) clinic. It is only the hospital that renders delivery services.

The data for the study were collected over the last two weeks of December 2001. Early in the month attempts to validate the questionnaire and pre-testing of the questionnaire were carried out.

4.2. Study Design

A cross-sectional survey was the design of the study.

4.3. Study Population/subjects and Sampling

4.3.1. Source population

The sample for the study was drawn from women of reproductive age living in Jijiga town.

4.3.2 Study subjects

The study subjects were randomly selected from all women of reproductive age whose first born was or would have been 5 years or less. The age limit was included to minimize recall difficulties.

4.3.3. Sample size

The total number of samples needed for the study from N = 17,057 women of reproductive age (23.5% of total population of Jijiga town), based on a precision level of 5% (d=0.05), desired

confidence level of 95% ($Z^2_{\alpha/2}$ = 1.96) and prevalence of negative birth outcomes among mutilated women of 50% was calculated to be 913, with 20% non-response rate and design effect of 2 considered. The proportion of negative birth outcomes among FGMed women was preferred to be 50% to get the largest possible sample size (p = q = 0.5) and since the outcome variables are more than one. The formula used to calculate the required sample size was:

$$n = n_o/(1+n_o/N)$$

Where $n_o = (Z_{\alpha/2})^2 p(1-p) / d^2$

4.3.4. Sampling procedure

In Jijiga town the composition of the kebeles in terms of ethnicity is in such a way that the first two kebeles are populated predominantly by Somalis and the last two kebeles by non-Somalis. The rest two kebeles are approximately equally populated. This stratification of kebeles into three strata by ethnicity was used to select a total of three kebeles by simple random sampling technique – one kebele from each stratum. Accordingly, kebele 01, 04 and 06 were selected. From each selected kebele two or three ketenas were selected by simple lottery method. In each of the selected ketenas two points were identified to start selecting respondents by way of households and a house to house search for eligible candidate was done until the required size from each ketena was achieved. In each household the wife of the house was selected as the study subject. Allocation of the desired number of households in each selected kebeles, hence in each selected ketenas was done based on the number of households reported by respective kebeles (fig 1).

4.4. Procedures of Research Instrument Development and Data Collection

4.4.1. Questionnaire Development

The principal investigator, with the help of research advisors, developed a structured questionnaire in English. Two medical doctors with good language ability of English and Amharic translated the English version to Amharic. The translated Amharic version of the questionnaire was then translated back to English by two other medical doctors looking for a possible gap in the contents of the original and the second translated versions. The same procedures were followed to develop the Somali version of the structured questionnaire. Based on the exercise, wording and ways of questioning to avoid vagueness were modified.

In addition to the questionnaire, six graduated wooden sticks were prepared for measurement of height and six ground-level weighing scales were secured from the regional health bureau.

4.4.2. Pre-testing

Pre-testing of the developed structured questionnaire was done in Chinaksen town of Jijiga District which is located 27 kilometers northwest of Jijiga town. It shares similar geographic, economic, cultural and socio-demographic characteristics with Jijiga town. It has two kebeles and one of the kebele was randomly selected for pre-test implementation. During the pre-testing the questionnaire was assessed for its clarity, understandability, length, completeness, and reliability. The sensitivity of the subject matter and pattern of response were also assessed.

A total of 60 households were systematically selected for the pre-testing but only in 44 of the households were eligible candidates found. Actually the same systematic approach was also proposed for the original data collection; however, after this finding during the pre-testing the procedure of selecting households was changed to the one mentioned in the sampling procedure section above. To complete the pre-testing sample size, 16 confirmed households were added. On average it took 45.1 minutes (range of 35 to 51) to administer the questionnaire. The pre-test data were analyzed after it was entered in to a computer using EPI-Info version 6 statistical package. Some previously unidentified but necessary skip patterns were identified and corrected. Some compounded questions were identified and correctly disaggregated. Some language modifications were also done to the Somali questionnaire. The final questionnaire was then prepared to have six parts (Annex 1).

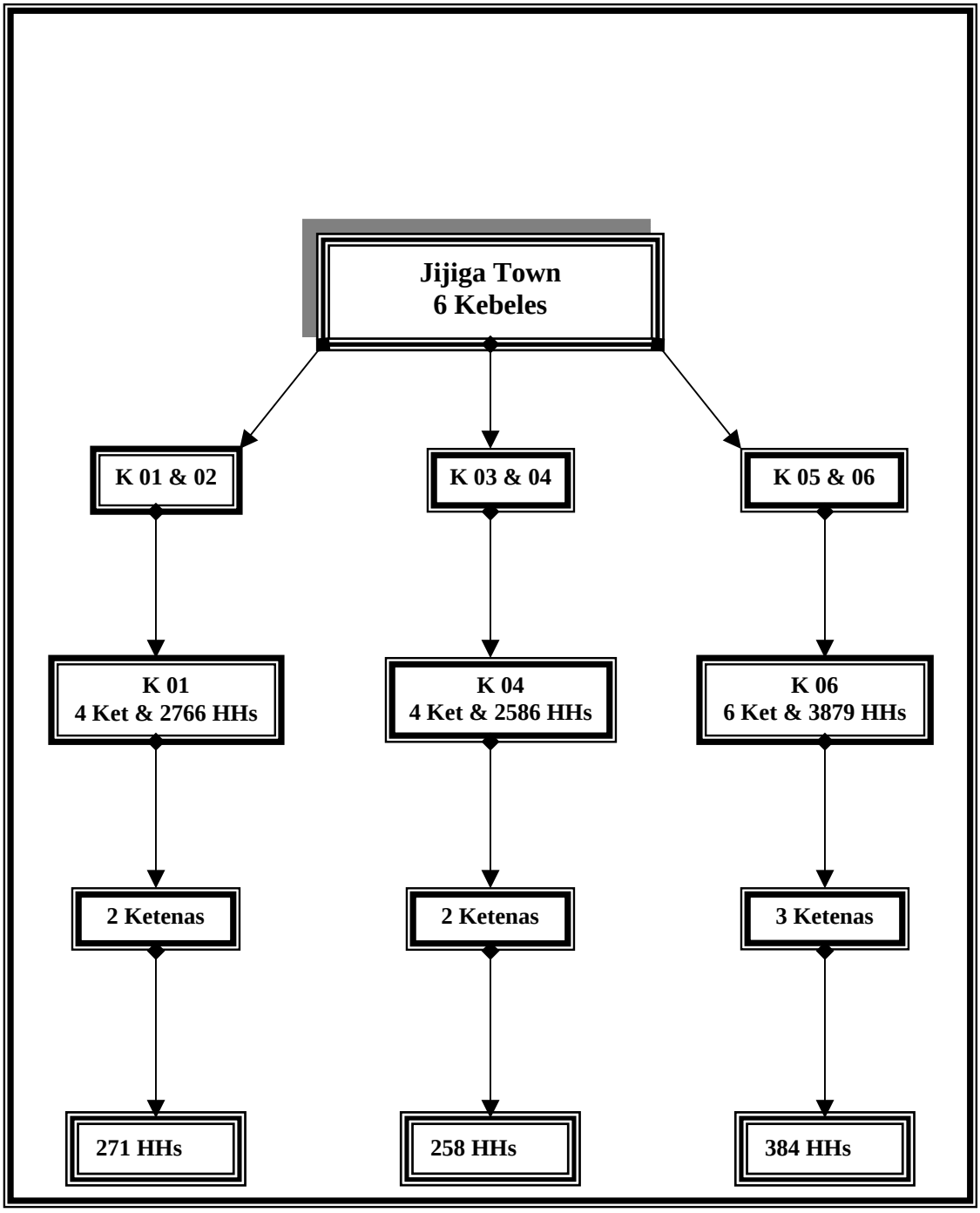

Figure 1: The sampling procedure of selecting study subjects, Jijiga town, Ethiopia 2002

4.4.3. Measurement Variables and Operational Definitions

Socio-demographic characteristics: Age, religion, ethnicity, schooling, level of school attainment, place of birth, marital status, marital type (in terms of polygamous versus monogamous union), parental education and parental religion.

Socio-economic variables: occupation, average monthly income, household possession (wealth), parental occupation and parental wealth,

- *Income*: Average monthly income was categorized in to low (Birr 0 to 299), medium (Birr 300 to 500) and high (above Birr 500).
- *Wealth*: Information on household income is very difficult and unreliable to collect. However, a proxy measure of the household economic status of the respondents was calculated from information on housing characteristics and household possessions. The scores were created by assigning a point each for possession of a radio, television, refrigerator, cot, bicycle, car, electricity, safe drinking water and sanitation facilities, and for the type of building material (brick and either cement or concrete). The total scores, which could range from 0 to 10, were divided into three groups (0-2, 3-6 and seven or more) signifying low, medium and high economic status, respectively (32).

Physical measurements: height, weight and distance from hospital

- Adult malnutrition (thinness) was calculated using BMI in Kg/m^2 and 18.49 was used as the cut off point for the parameter; i.e., a women whose BMI was less than or equals to 18.49 Kg/m^2 was considered to be thin (33, 34).
- Risk height for the development of birth complication was taken as 150 centimeters or below (35, 36).

- The distance of the house of the respondents from the hospital (Karamara Hospital) was estimated by the amount of time taken by the respondents to walk to the hospital, and a house was labeled distant when it takes 30 or more minutes to the hospital (37, 38).

Reproductive characteristics: age at first marriage, age at first pregnancy, age at first birth, gravidity, parity, abortions, stillbirth, female genital mutilation

- Infibulated women are those genitally mutilated women whose vaginal area is sewn closed (FGM Type III)
- Non-infibulated women are those genitally mutilated women whose vaginal area is not sewn at all (FGM Types I and II)

First and second pregnancy/delivery characteristics: ANC follow-up, place of delivery, history of bad pregnancy outcomes and birth complications (episiotomies, perineal tearing, instrumental delivery, obstructed/prolonged labor, caesarian deliveries, severe hemorrhage, postnatal problems).

- Episiotomy included both anterior (defibulation) and posterolateral incisions of the vulva during delivery.
- Labour was labeled as prolonged when it lasted longer than 16 hours for primips and 12 hours for multips (35, 36).
- Postnatal period was considered to be problematic (complicated) when one or more of the following complications had been reported by the respondents: heavy bleeding,

foul-smelling discharge, urinary incontinence, rectal incontinence, generalized fever, or wound infection.

4.4.4. Data Collection

Twelve interviewers were recruited from Jijiga town. The criteria used for selecting the interviewers were female sex, fluency in Amharic (six of them) and Somali (six of them) languages, educational status of secondary school or above, previous work experience of data collection was given credit and good assessment results after the training sessions.

The data collectors were given training for five days (three days before and two days after the pre-testing) in the Conference Hall of Karamara Hospital. The training focused on discussing the overall purpose of the study and securing verbal consent from each study participants, emphasizing the issue of confidentiality, and administering the questionnaires in full and to eligible respondents using the appropriate questionnaire and language. The training also included measurement of height and weight by using graduated wooden sticks and ground-level weighing scales.

Data were collected from December 14 to 30, 2001. To facilitate data collection and measurements, two interviewers (one Amharic and one Somali speaker) were made into one group and two groups of data collectors were made responsible for one kebele. The overall activity of data collection was supervised and coordinated by the principal investigator and three other supervisors, all nurses recruited from Karamara Hospital. The supervisors were responsible for managing and coordinating the overall field activities in each kebele, and onsite checking of the quality of the data collected before leaving each ketena. They were also responsible for the

checking of the weighing scale by using a standard mass at least twice a day. Any missing or inconsistent data detected were sent back for immediate correction while still in the ketena. A household was left out of the study after three callbacks were made within a week.

4.5. Data management, analysis and interpretation

After pre-coding of all the study variables and giving appropriate variable names, the raw data were entered into computers using EPI-Info version 6 data entry program. This was done by the principal investigator together with a person who has the expertise in data entry. Customized CHECK file was developed and automatically used to check for ranges, skip (jump) and legal values during the data entry processes. Computer printouts of frequencies were used to check for outliers. Logical and consistency errors were also checked after completing data entry. Any error identified at this stage was corrected after revision of the original questionnaire retrieved using the corresponding record number.

The data were also exported to SPSS for windows 10 statistical package for the purpose of analysis. Analysis was done using both statistical packages. Frequencies, proportions and summary statistics were used to describe the study population in relation to relevant self and parental variables. Odds ratio with 95% confidence interval in most cases and Chi-squared test with p value in some cases, along with binary & multiple logistic regression were used to assess the significance and strength of associations.

4.6. Ethical Considerations

Verbal consent of subjects to participate in the study was secured before conducting the interview. This was done with a page of consent letter attached to the cover of the questionnaire which stated the general purpose of the study, the need and benefits of conducting the study, and issues of confidentiality (Annex 1). The interviewers briefly discussed the contents of the consent

letter before proceeding to the interview. Participants were also informed that they have the right to refuse to participate in the study or to discontinue the interview at any time they want to.

A formal letter was written to the Somali National Regional Health Bureau. The bureau also wrote formal letters to the Jijiga District Administration Office and respective kebeles explaining the relevance of the study.

The study proposal had clearance from the ethical committee of the Department of Community Health and School of Graduate Studies, Addis Ababa University.

V. RESULTS

5.1. Socio-demographic/economic description of study subjects and their parents

The total number of women studied was 872 with a non response rate of 4.5%. The majority of non respondents lived in kebele-01(58.5%), were Muslim (95.5%), Somali (63.6%) and illiterate (63.6%). Unfortunately the data collection was initiated during the month of Holy Ramadan and respondents complained of weakness and lengthy interview. Of the sampled 872 women, 247(28.3%) were from kebele-01, 253(29%) from kebele-04 and 372(42.7%) from kebele-06. The majority of subjects were younger than 25 (55%). The mean age of the study population was 24.2 (± 4.5) years. The major ethnic groups were Somali constituting 42.5% and Amhara, 32.7%. Islam was the dominant religion, 57.2%, followed by Orthodox Christian, 36.1%. The majority (65.1%) of women were literate with 42.4% of them having reached secondary school level. Most women, 64.9%, were born in urban settings. (Table 1)

Eight hundred forty five (96.9%) of the subjects had been married with a polygamous marriage rate of 16.6%; however, 85.5% of them were currently married, the rest either separated (3.5%), divorced (5.1%) or widowed (2.9%). The majority of women, 76.1%, were housewives and only 7.30% were involved in the civil sector. Five hundred twenty (59.8%) families earned an average monthly income of more than Birr 300, 82(9.4%) earn less than Birr 100 and 143(16.4%) don't know their monthly income. In terms of household possessions, the majority (60.8%) were in the medium group. (Table 1)

A slight majority of parents of the study subjects were Muslim (56.6%) and illiterate (50.1%). Two (0.2%) subjects were from parents of mixed religion. One of the parents was literate for

27.2% of subjects and both parents were literate for 22.8% of subjects. One hundred thirty one (33%) of the literate fathers had reached secondary school level while only 14.6% of literate mothers had done so. The fathers of 33.2% of the subjects were farmers and those of 18% were civil servants. Like the subjects, the majority (83.7%) of their mothers were housewives with only 1.8% involved in the civil sector. Again like the subjects, most of their parents were in the medium group in terms of wealth. The average family size of parents of the subjects (including the subject) was 8.8 (± 2.9) with a slight majority (52.4%) having a family size of nine or more.

Table 1: Socio-demographic and economic characteristics of the study population (n=872), Jijiga Town, Ethiopia, 2002.

Socio-demographic and economic characteristics	Frequency	Percent
Age (in years)		
15-24	425	48.7
25-34	324	37.2
35-49	23	2.6
Don't know/Missing	102	11.7
Religion		
Muslim	499	57.2
Orthodox Christian	315	36.1
Other Christians	58	6.7
Ethnicity		
Somali	371	42.5
Amhara	285	32.7
Oromo	109	12.5
Others	107	12.3
Education		
Illiterate	304	34.9
Literate	568	65.1
Read/Write only	34	6.0
Elementary/Junior	288	50.7
Secondary/Higher	246	43.3
Marital Status		
Ever married	841	96.4
Never married	27	3.1
Missing/No response	4	0.5
Marriage Type (n=845)		
Monogamous	687	81.3
Polygamous	140	16.6
Don't know/No response	18	2.1
Occupation		
Housewife	664	76.1
Merchant	75	8.6
Civil servant	65	7.5
Daily laborer	39	4.5
Student	17	1.9
House maid	10	1.1
Private Employee	2	0.2
Income (Birr)		
< 100	82	9.4
100 - 299	125	14.3
300 - 500	335	38.4
> 500	185	21.2
Don't Know/Missing	145	16.6
Household Possessions (Wealth)		
Low	137	15.7
Medium	530	60.8
High	205	23.5

5.2. Reproductive Health Status

Of the total 872 respondents 837 (96.0%) were genitally mutilated while only 26 (3.0%) were non-mutilated; the rest 9 (1%) did not know whether they were mutilated or not. Of the 837 genitally mutilated women, 434 (51.8%) were infibulated (FGM type III), 399 (47.7%) had their clitoris partially or completely cut (FGM type I/II, non-infibulated) and the rest 4 (0.5%) could not tell the type of mutilation they had undergone. No subject mentioned the atypical FGM type IV. The median age at mutilation was found to be 6 years. The majority (90.1%) were mutilated by a traditional birth attendant (TBA) or a traditional circumciser. Medical personnel were reported in 24 (3%) of cases.

The majority of subjects were primigravid (60.7%) and primiparous (62.0%) mothers with only 0.5% and 4.6% having had four or more pregnancies and deliveries, respectively. Forty six (5.3%) of the women had had a still birth with the great majority (95.7%) of them only once and 61.4% of them at a gestational age of 9 months. Ninety four (10.8%) of the subjects had experienced abortion with the majority (74.5%) having it once but some 15% of them had it three or more times (not necessarily consecutively). For the majority (64.9%) the first abortion happened during the first trimester of pregnancy. The mean age of study subjects at first marriage and at first pregnancy was 20.04 (±3.93) and 21.08(±3.95) years, respectively. Their mean age at first birth was 21.78 (± 4.09).

There was a significant difference (Kruskal-Wallis $H=245.8$; $p<0.001$) between the median ages at which infibulated and non-infibulated women were mutilated. It was 7 days for non-infibulated and 7 years for infibulated women.

The study subjects showed some difference in terms of socio-demographic factors. The mean age was 23.5 years for infibulated women and 24.93 years for non-infibulated women which was significantly different at P<0.001. Genital mutilation was associated with religion, ethnicity, education, place of birth, marital status and occupation of the women on unadjusted analysis. The infibulating type of mutilation was found to be associated with Muslim religion, Somali ethnicity and polygamous union. (Tables 2 & 3)

Women's age in 5-year groups was tested for trend. There was a significant decreasing linear trend of infibulating females (χ^2 = 4.88; p = 0.027) but there was no linear trend in mutilating females in general.

When all variables were entered into a logistic regression analysis, only religion and occupation had statistically significant relation with the prevalence of genital mutilation. Age, which was not associated with genital mutilation in the unadjusted analysis, was found to be significantly associated with female genital mutilation (OR=3.79; CI:1.17,12.28). Age above 25 years and being Muslim were associated with higher odds of being genitally mutilated. Employed women had significantly lower odds of reporting genital mutilation. Logistic regression in relation to type of genital mutilation showed that religion, ethnicity and marital type were significant factors. (Tables 2 & 3)

Parental socio-demographic characteristics were also found to affect distribution of the practice of female genital mutilation. The odds of a woman with Muslim parents of being genitally mutilated and infibulated respectively, were 17.18(CI:3.86,107.23) and 305.41 (CI:131.77,744.25) times higher than the odds of a woman from Christian family. A woman

whose either or both parents were literate was at a lesser odds of being genitally mutilated and infibulated than was a woman whose parents were illiterate (OR=0.36; CI:0.13,0.91 and OR=0.57; CI:0.43,0.77 respectively). Trend analysis also showed that as the education level of fathers increased there was a decreasing linear trend of performing infibulation ($P<0.05$). However level of maternal education showed no trend; also there was no decreasing trend of performing female genital mutilation across either parents' educational level. Parental occupation and parental wealth were also found to be associated with FGM. Women whose parents were employed were less likely to report infibulation than women of unemployed parents (OR=0.23; CI:0.05,0.87 and OR=0.37; CI:0.27,0.51 for mothers and fathers employment, respectively). Parental wealth was significantly associated with both presence/absence and type of FGM ($p<0.01$)

Logistic regression analysis identified only parents' religion and wealth as significant predictors of women's genital status and type of mutilation. Women from Muslim parents were more commonly genitally mutilated and infibulated than were women from Christian parents. Women from wealthy parents are significantly protected from FGM, but among women who were genitally mutilated, women from highly wealthy parents were at higher risk of being infibulated than were women from the low-wealth parents.

On average infibulated women marry and have their first pregnancy earlier than non-infibulated women ($p<0.01$). Infibulated women also had their first birth earlier ($p<0.001$) at a mean age of 21.12 (± 3.99) years while non-infibulated women deliver their first baby at a mean age of 22.46 (± 4.10).

Of the 44 stillbirths reported, 1(2.3%) was experienced by an non-mutilated woman, 12(27.3%) by non-infibulated and 31(70.5%) by infibulated women which was statistically significant ($p<0.05$). In addition the odds of infibulated women reporting stillbirth was 2.48(CI:1.20,5.23) times higher than were non-infibulated women. Although the occurrence of abortion was not significantly different among the three groups of women, infibulated women had 3.85 (CI:1.24,12.24) times higher odds of reporting multiple abortions than did non-infibulated women.

Table 2: Relationship between genital mutilation and socio-demographic/economic characteristics of the study population, Jijiga Town, Ethiopia, 2002

Variables	Mutilated, n (%)			Crude OR (95%CI)	Adjusted OR (95% CI)
	Yes (n=837)	No (n=26)	Total (n=863)		
Age(n=763)					
15-25	495(67.1)	21(84.0)	516(67.6)	1.00	1.00
26-49	243(32.9)	4(16.0)	247(32.4)	2.58(0.86,10.4)	3.79(1.17,12.3)
Religion(n=863)					
Christian	340(40.6)	24(92.3)	364(42.2)	1.00	1.00
Muslim	497(59.4)	2(7.7)	499(57.8)	17.5(4.3,153.7)	24.3(1.3,456.0)
Ethnicity(n=863)					
Non-Somali	467(55.8)	25(96.2)	492(57.1)	1.00	1.00
Somali	370(44.2)	1(3.8)	371(42.9)	19.8(3.2,815.4)	1.6(0.09,28.03)
Education(n=863)					
Illiterate	300(35.8)	3(11.5)	303(35.1)	1.00	1.00
Literate	537(64.2)	23(88.5)	560(64.9)	0.23(0.04,0.78)	0.66(0.11,4.13)
Elementary/Junior	311(57.9)	7(30.4)	318(56.8)	1.00	1.00
Secondary/Higher	226(42.1)	16(69.6)	242(43.2)	0.32(0.12,0.84)	0.78(0.24,2.60)
Birth Place (n=859)					
Urban	533(64.0)	22(84.6)	555(64.6)	1.00	1.00
Rural	300(36.0)	4(15.4)	304(35.4)	3.1(1.04,12.46)	1.66(0.40,6.88)
Marital Status(n=863)					
Never married	21(2.5)	5(19.2)	263.0)	1.00	1.00
Ever married	816(97.5)	21(80.8)	837(97.0)	9.25(2.47,28.5)	1.00
Marital Type (n=820)					
Monogamous	660(82.6)	20(95.2)	680(82.9)	1.00	1.00
Polygamous	139(17.4)	1(4.8)	140(17.1)	4.2(0.66,175.8)	1.42(0.17,11.7)
Occupation(n=863)					
Unemployed	780(93.2)	20(76.9)	80092.7)	1.00	1.00
Employed	57(6.8)	6(23.1)	63(7.3)	0.24(0.09,0.77)	0.29(0.09,0.93)
Income Level (n=718)					
Low	197(28.4)	8(33.3)	205(28.6)	1.00	1.00
Medium	321(46.2)	10(41.7)	331(46.1)	1.3(0.46,3.65)	1.73(0.34,8.80)
High	176(25.4)	6(25.0)	182(25.3)	1.19(0.35,4.25)	1.66(0.45,6.20)
Wealth(n=863)					
Low	132(15.8)	5(19.2)	137(15.9)	1.00	1.00
Middle	510(60.9)	12(46.2)	522(60.5)	1.61(0.44,5.01)	2.5(0.18,35.97)
High	195(23.3)	9(34.6)	204(23.6)	0.82(0.21,2.80)	0.57(0.21,1.55)

Table 3: Relationship between type of genital mutilation and selected socio-demographic characteristics of the study population, Jijiga Town, Ethiopia, 2002.

Variables	Type of FGM, n (%)			Crude OR (95%CI)	Adjusted OR (95% CI)
	Type III (n=434)	Type I/II (n=399)	Total (n=833)		
Age(n= 734)					
15-25	260(73.9)	232(60.7)	492(67.1)	1.00	1.00
26-49	92(26.1)	150(39.3)	242(32.9)	0.55(0.39,0.76)	0.97(0.45,2.11)
Religion(n=833)					
Christian	8(1.8)	328(82.2)	336(40.3)	1.00	1.00
Muslim	426(98.2)	71(17.8)	497(59.7)	246(112.36,560.87)	64.5(22.07,188.52)
Ethnicity(n=833)					
Non-Somali	78(18.0)	385(96.5)	463(55.6)	1.00	1.00
Somali	356(82.0)	14(3.5)	370(44.4)	125.5(67.7,236.63)	67.59(28.8,158.54)
Education(n=833)					
Illiterate	214(49.3)	86(21.6)	290(36.1)	1.00	1.00
Literate	220(50.7)	313(78.4)	533(63.9)	0.28(0.21,0.39)	0.52(0.23,1.19)
Elementary/Junior	165(75.0)	142(45.4)	307(57.6)	1.00	1.00
Secondary/Higher	55(25.0)	171(54.6)	226(42.4)	0.28(0.19,0.41)	0.74(0.22,2.48)
Birth Place (n=829)					
Urban	273(63.0)	258(65.2)	531(64.1)	1.00	1.00
Rural	160(37.0)	138(34.8)	298(35.9)	1.10(0.82,1.47)	0.47(0.19,1.17)
Marital Type (n=796)					
Monogamous	315(75.4)	343(90.7)	658(82.7)	1.00	1.00
Polygamous	103(24.6)	35(9.3)	138(17.3)	3.2(2.08,4.95)	5.18(1.90,14.14)

5.3. Knowledge, Attitude and Practice of Female Genital Mutilation

In general, 67.9% of women knew that FGM was associated with health problems. The majority of women (56.5%) claimed that female genital mutilation was a good practice but only 32.5% of these good-claimers knew that it was associated with health problems. The majority (57%) of respondents did not support the continuation of the practice. Among those women who supported continuation of the practice, the majority (53.7%) preferred the continuation of FGM type I/II - "Sunna circumcision" as it was called locally. A little more than half of the interviewed women (53.9%) had a female child and a slight majority of them (53%) had mutilated or were planning to mutilate their daughters.

Knowledge of women about health problems associated with female genital mutilation was found to be affected by religion, ethnicity, schooling, place of birth, marital type and economic factors. Women's age had no significant relation with knowledge. However, logistic regression analysis showed that only being Muslim, illiterate and born in rural settings were statistically significant factors to preclude women from knowing that FGM is associated with health hazards. (Table 4)

Table 4: Relationship between knowledge about FGM's health hazards and socio-demographic/ economic characteristics of the study population, Jijiga Town, Ethiopia, 2002.

Variables	Know Health Effect, n (%)			Crude OR (95% CI)	Adjusted OR (95% CI)
	Yes (n=591)	No (n=280)	Total (n=871)		
Age(n=771)					
15-25	375(66.7)	145(69.4)	520(67.4)	1.00	1.00
26-49	187(33.3)	64(30.6)	251(32.6)	1.13(0.79,1.62)	0.94(0.65,1.38)
Religion(n=871)					
Christian	310(52.5)	62(22.1)	372(42.7)	1.00	1.00
Muslim	281(47.5)	218(77.9)	499(57.3)	0.26(0.18,0.36)	0.51(0.30,0.86)
Ethnicity(n=871)					
Non-Somali	376(63.6)	124(44.3)	500(57.4)	1.00	1.00
Somali	215(36.4)	156(55.7)	371(42.6)	0.45(0.34,0.61)	0.76(0.46,1.25)
Education(n=871)					
Illiterate	146(24.7)	158(56.4)	304(34.9)	1.00	1.00
Literate	445(75.3)	122(43.6)	567(65.1)	3.95(2.89,5.40)	1.55(1.04,2.31)
Elementary/Junior	232(52.1)	90(73.8)	322(56.8)	1.00	1.00
Secondary/Higher	213(47.9)	32(26.2)	245(43.2)	2.58(1.62,4.13)	1.54(0.89,2.65)
Place of Birth(n=867)					
Urban	431(73.2)	131(47.1)	562(64.8)	1.00	1.00
Rural	158(26.8)	147(52.9)	305(35.2)	0.33(0.24,0.44)	0.63(0.42,0.96)
Marital Type(n=826)					
Monogamous	483(85.3)	203(78.1)	686(83.1)	1.00	1.00
Polygamous	83(14.7)	57(21.9)	140(16.9)	0.61(0.41,0.91)	0.96(0.61,1.51)
Occupation(n=871)					
Unemployed	532(90.0)	274(97.9)	806(92.5)	1.00	1.00
Employed	59(10.0)	6(2.1)	65(7.5)	5.06(2.15,14.52)	2.11(0.92,4.89)
Income Level(n=726)					
Low	108(21.6)	99(43.6)	207(28.5)	1.00	1.00
Medium	252(50.5)	82(36.1)	334(46.0)	2.82(1.91,4.15)	1.01(0.54,1.89)
High	139(27.9)	46(20.3)	185(25.5)	2.77(1.76,4.36)	0.73(0.44,1.21)
Wealth(n=871)					
Low	53(9.0)	84(30.0)	137(15.8)	1.00	1.00
Middle	382(64.6)	147(52.5)	529(60.7)	4.12(2.73,6.22)	1.16(0.61,2.18)
High	156(26.4)	49(17.5)	205(23.5)	5.05(3.07,8.31)	0.98(0.65,1.48)

When women's attitude towards genital mutilation was examined by selected background characteristics, women's religion, ethnicity, schooling, place of birth, income level and wealth were all found to be associated with both supporting continuation of FGM and preference for infibulation of girls. In addition, support for continuation was negatively associated with school attainment; and all five women who had higher education did not support it. Age, marital status and marital type were also found to be associated with support. Occupation was not associated with either supporting of continuation of FGM or preference to a specific type of FGM. Marital status as well as type was not associated with preference to a specific type of FGM. (Table 5)

Logistic regression analysis identified women's religion, ethnicity, education and wealth as significant predictors of attitudes towards FGM. Being Muslim or Somali, or having low household possession score was significantly associated with supporting continuation of FGM as well as preferring infibulation. Women born in rural setting had significantly higher odds of preferring FGM Type III to Type I/II. Women's being educated significantly prevented them from supporting continuation of FGM. In addition, it was also found that as the level of education of women increased there was a linear trend of opposing continuation of FGM ($p<0.001$). (Table5)

Examination of respondents' practice of mutilating their own daughter revealed that women's action or plan for action was associated with almost the same socio-demographic and economic factors that determine their attitude of supporting continuation of FGM. Moreover, the factors acted in the same fashion (Table 6). Among women who had a female child, women were more likely to have their daughters genitally mutilated or to plan to mutilate them (53%) than to support genital mutilation (45.3%) ($p<0.01$).

When women's attitude and practice were examined in terms of knowledge, only 39.8% of those women who genitally mutilated or were planning to mutilate their daughters and 32.33% of those who supported continuation knew that FGM has health hazards.

Table 5: Relationship between attitude towards continuation of FGM and socio-demographic/ economic characteristics of the study population, Jijiga Town, Ethiopia, 2002.

Variables	FGM Continue, n (%)			Crude OR (95% CI)	Adjusted OR (95% CI)
	Yes (n=375)	No (n=497)	Total (n=872)		
Age(n=772)					
15-25	218(71.9)	302(64.4)	520(67.4)	1.00	1.00
26-49	85(28.1)	167(35.6)	252(32.6)	0.71(0.51,0.98)	1.01(0.68,1.52)
Religion(n=872)					
Christian	50(13.3)	323(65.0)	373(42.8)	1.00	1.00
Muslim	325(86.7)	174(35.0)	499(57.2)	12.07(8.38,17.4)	3.47(2.06,5.84)
Ethnicity(n=872)					
Non-Somali	121(32.3)	380(76.5)	501(57.5)	1.00	1.00
Somali	254(67.7)	117(23.5)	371(42.5)	6.82(5.0,9.31)	3.44(2.08,5.7)
Education(n=872)					
Illiterate	197(52.5)	107(21.5)	304(34.9)	1.00	1.00
Literate	178(47.5)	390(78.5)	568(65.1)	0.25(0.18,0.34)	0.64(0.42,0.98)
Elementary/Junior	134(75.3)	188(48.2)	322(56.7)	1.00	1.00
Secondary/Higher	44(24.7)	202(51.8)	246(43.3)	0.31(0.20,0.46)	0.71(0.41,1.20)
Place of Birth(n=868)					
Urban	206(55.2)	357(72.1)	563(64.9)	1.00	1.00
Rural	167(44.8)	138(27.9)	305(35.1)	2.1(1.56,2.81)	1.23(0.78,1.96)
Marital Status(n=872)					
Never married	6(1.6)	21(4.2)	27(3.1)	1.00	1.00
Ever married	369(98.4)	476(95.8)	845(96.9)	2.71(1.04,8.29)	1.00
Marital Type(n=827)					
Monogamous	273(76.5)	414(88.1)	687(83.1)	1.00	1.00
Polygamous	84(23.5)	56(11.9)	140(16.9)	2.27(1.54,3.35)	1.31(0.80,2.13)
Occupation(n=872)					
Unemployed	362(96.5)	445(89.5)	807(92.5)	1.00	1.00
Employed	13(3.5)	52(10.5)	65(7.5)	0.31(0.16,0.59)	0.76(0.36,1.58)
Income Level(n=727)					
Low	115(38.1)	92(21.6)	207(28.5)	1.00	1.00
Medium	113(37.4)	222(52.2)	335(46.1)	0.41(0.28,0.59)	0.77(0.39,1.51)
High	74(24.5)	111(26.1)	185(25.4)	0.53(0.35,0.81)	1.36(0.82,2.27)
Wealth(n=872)					
Low	114(30.4)	23(4.6)	137(15.7)	1.00	1.00
Middle	197(52.5)	333(67.0)	530(60.8)	0.12(0.07,0.20)	0.19(0.09,0.43)
High	64(17.1)	141(28.4)	205(23.5)	0.09(0.05,0.16)	0.69(0.45,1.05)

Table 6: Relationship between practice of FGM and socio-demographic/economic characteristics of the study population, Jijiga Town, Ethiopia, 2002.

Variables	Planned/Acted FGM, n (%)			Crude OR (95% CI)	Adjusted OR (95% CI)
	Yes (n=249)	No (n=221)	Total (n=470)		
Age(n=421)					
15-25	143(67.8)	120(57.1)	263(62.5)	1.00	1.00
26-49	68(32.2)	90(42.9)	158(37.5)	0.63(0.42,0.97)	0.66(0.36,1.19)
Religion(n=470)					
Christian	35(14.1)	170(76.9)	205(43.6)	1.00	1.00
Muslim	214(85.9)	51(23.1)	265(56.4)	20.38(12.35,33.79)	3.17(1.54,6.56)
Ethnicity(n=470)					
Non-Somali	73(29.3)	197(89.1)	270(57.4)	1.00	1.00
Somali	176(70.7)	24(10.9)	200(42.6)	19.79(11.64,33.89)	11.29(5.10,24.97)
Education(n=470)					
Illiterate	115(46.2)	36(16.3)	151(32.1)	1.00	1.00
Literate	134(53.8)	185(83.7)	319(67.9)	0.23(0.14,0.36)	0.48(0.23,0.99)
Elementary/Junior	103(76.9)	76(41.1)	179(56.1)	1.00	1.00
Secondary/Higher	31(23.1)	109(58.9)	140(43.9)	0.21(0.12,0.35)	0.50(0.23,1.09)
Place of Birth(n=467)					
Urban	143(57.9)	164(74.5)	307(65.7)	1.00	1.00
Rural	104(42.1)	56(25.5)	160(34.3)	2.13(1.41,3.22)	1.72(0.83,3.56)
Marital Status(n=470)					
Never married	3(1.2)	8(3.6)	11(2.3)	1.00	1.00
Ever married	246(98.8)	213(96.4)	459(97.7)	3.08(0.73,18.21)	1.00
Marital Type(n=447)					
Monogamous	184(77.3)	191(91.4)	375(83.9)	1.00	1.00
Polygamous	54(22.7)	18(8.6)	72(16.1)	3.11(1.70,5.74)	1.19(0.82,4.47)
Occupation(n=470)					
Unemployed	239(96.0)	195(88.2)	434(92.3)	1.00	1.00
Employed	10(4.0)	26(11.8)	36(7.7)	0.31(0.14,0.70)	0.60(0.20,1.81)
Income Level(n=386)					
Low	65(32.3)	34(18.4)	99(25.6)	1.00	1.00
Medium	77(38.3)	106(57.3)	183(47.4)	0.38(0.22,0.65)	0.70(0.22,2.20)
High	59(29.4)	45(24.3)	104(27.0)	0.69(0.37,1.26)	1.4(0.60,3.23)
Wealth(n=470)					
Low	64(25.7)	6(2.7)	70(14.9)	1.00	1.00
Middle	129(51.8)	163(73.8)	292(62.1)	0.07(0.03,0.18)	0.09(0.02,0.50)
High	56(22.5)	52(23.5)	108(23.0)	0.10(0.03,0.26)	1.09(0.55,2.16)

Among the women who supported continuation of FGM, the majority (66.67%) of them stated that they wanted the practice to be continued because it was a tradition and custom of the society. The second most common reason given by 54.4% of women was that it was a religious demand but 95.6% of women who gave this reason were Muslims. In addition, some 32% of women said that female genital mutilation protects virginity and prevents immorality. (Table 7)

Among women who thought the practice of female genital mutilation should not be continued, the overwhelming majority (77.2%) cited medical complications. A substantial proportion (32.3%) of women also mentioned religious prohibition. These women were also asked what they think was the best ways to eradicate female genital mutilation and the majority (74.2%) suggested an educational campaign to women. Enforced legislation was mentioned by 39.7% of women and some 11% of women suggested improving the status of women. Only 9.8% of women mentioned that encouragement of fathers to take more responsibility was the best way. (Table 7)

Examination of women's perceptions about their husbands' attitude towards female genital mutilation revealed that 30% of women either did not know their husband's opinion about female genital mutilation or said that he had no opinion. Overall, 43.8% of husbands were perceived to oppose continuation of the practice while 25.8% were thought to support it. Comparison of these figures with those of the women suggests that men were less likely than their wives (43%) to support continuation of female genital mutilation ($p<0.001$). (Table 7)

Table 7: Number and percentage of women who favor or oppose continuation of FGM by reasons given for attitude, perception of their husbands' opinion and their opinion of best way of eradicating FGM, Jijiga Town, Ethiopia, 2002.

Reason for Attitude	Number of times Mentioned	Percents
Favor (n=375)		
Good tradition and custom	250	66.7
Religious demand	204	54.4
Protects virginity	98	26.1
Better marriage prospects	63	16.8
Prevents immorality	39	10.4
Cleanliness	12	3.2
Increases fertility	6	1.6
Increase pleasure of husband	5	1.3
Never thought about reason	6	1.6
Other	3	0.8
Oppose (n=495)		
Medical complication	382	77.2
Religious prohibition	160	32.3
Painful personal experience	99	20.0
Sexual dissatisfaction	66	13.3
Against human rights and women's dignity	43	8.7
Infertility	2	0.4
Others	17	3.4
Husband's opinion on continuation (n=861)		
Oppose	377	43.8
Favor	222	25.8
No opinion	6	0.7
Unknown	256	29.7
Best way of eradication (n=489)		
Educational campaign to women	363	74.2
Enforced legislation	194	39.7
Improvement of women's status	52	10.6
Encourage fathers to have more responsibility	48	9.8
Sex education	8	1.6
Others	1	0.2

5.4. Pregnancy and Delivery Outcomes

The majority of women had attended antenatal care (ANC) during their pregnancies (76.7% during the first and 71.3% during the second). The mean month of their first visit was 3.7 (±1.5) months for both pregnancies. More than 90% of women during both of their pregnancies visited ANC for either check-up or vaccination and only 6-7% of women visited ANC for pregnancy related illnesses. Morning sickness (55%) followed by peptic ulcer disease-PUD (12.5%) and anemia (10%) were the three most common illnesses for the initial ANC visit during the first pregnancy while the latter two persisted to be the main problems during the second pregnancy. During both pregnancies, the majority (76.1% and 71.3%, respectively) had made four or more visits to the ANC. Some 9-10% of women had major illnesses during their pregnancies. Severe anemia (30.7%), febrile illnesses (21.3%) and hypertension (18.7%) were the most common major illnesses among women who were pregnant for the first time while the two earlier conditions at increased proportions (32.3% &35.5%, respectively) and renal diseases (22.6%) were so among women who were pregnant for the second time.

Six hundred four (69.3%) of the first and 62.3% of the second pregnancies were delivered at health institutions. Episiotomies occurred among 61% of women who were delivering for the first time and 28.1% of women delivering for the second time ($p<0.001$). Only a few deliveries needed instrumentation; 6.6% of the first-time and 3.2% of the second-time deliveries ($p<0.05$). The Cesarean section rate was found to be 3.1% and 1.3% during the first-time and second-time deliveries respectively ($p<0.05$).

In general among women who were delivering for the first time: 22.5% reported having had prolonged labor; 10.3%, perineal tear; 9.8%, heavy bleeding during labor; 36.2%, problematic

postnatal period and 1.1% blood transfusion. Of the proxy birth complication measures: 13.7% reported having used IV fluid; 21.1%, pitocin (oxytocin) and 62.5%, sitzbath. The figures for women who were delivering for the second time were 40.1%, 7.2%, 7.2%, 34.0%, 1.0%, 58.3%, 7.3% and 17.4%, respectively. Only prolongation of labor and utilization of IV fluids were statistically significant ($p<0.01$).

As one goes from uncut through non-infibulated to infibulated women and when infibulated and non-infibulated women were compared separately, a lot of significant differences were observed. Attendance and frequency of attendance of ANC during pregnancy-one but only attendance of ANC during pregnancy-two showed significant difference between infibulated and non-infibulated women. Non-infibulated women were 3.24(CI:2.25,4.68) and 2.74(CI:1.48,5.13) times more likely to attend ANC than were infibulated women during their first and second pregnancies respectively. In addition, non-infibulated women were 2.87(CI:1.02,9.21) times more likely to make more than one visit for ANC than were infibulated women.

Of the total 265 home deliveries among women who delivered for the first time, 4(1.5%) were by non-mutilated women; 81(30.6%) by non-infibulated and 180(67.9%) by infibulated women. The difference was statistically significant ($p<0.001$). Among those who delivered in health institution, only 3.2% of uncut women required the assistance of higher professionals (GP & Gyn/Obs specialist) while 38.7% and 58.1% of non-infibulated and infibulated women respectively requiring so ($p<0.05$).

During the second pregnancy, similar patterns of delivery places and need for professional assistance during labor were. When we look at the strength of these associations, infibulated

women were 2.77(CI:2.0,3.84) and 1.98 (CI: 1.15,3.41) times more likely to deliver at home than were non-infibulated women during their first and second deliveries, respectively. Also infibulated women sought the attention of professionals 2.46(CI:1.68,3.61) and 3.0(CI:1.39,6.54) times more commonly than did non-infibulated women during their first and second deliveries, respectively. Babies born to infibulated primi women were significantly smaller than average than those born to non-infibulated primi women (OR=0.66; CI: 0.46,0.96).

The significant association seen between some reproductive health practices and genital mutilation on the bivariate analysis were tested for confounders. It was found that the difference observed between infibulated and non-infibulated women in terms of ANC follow-ups and the need for professional attention were confounded findings. Education and wealth (medium) were the only significant predictors of ANC attendance. However, delivery place pattern was statistically significantly different between infibulated and non-infibulated women even after controlling for possible confounders. The odds of a non-infibulated woman delivering at home was 0.30 (CI: 0.13, 0.70) times lower than that of an infibulated woman. In addition, being Somali, literate and wealthy were also significant factors associated with institutional delivery.

Length of labor was found to significantly differ ($p<0.05$) among the three groups of mothers when they had their first baby. Four (15.4%) of uncut (non-mutilated), 76(19.2%) of non-infibulated and 112(25.9%) of infibulated women had their labor prolonged. In addition, infibulated women were 1.47(CI:1.04,2.08) and 1.99(CI:1.17,3.39) times more likely than their cut counterparts to report prolonged labor during their first and second deliveries, respectively. (Table 8)

Episiotomy and genital trauma (perineal tear) were not found to be significantly associated with genital mutilation or type of genital mutilation during either deliveries; however, their proxy measure - sitzbath - was less commonly used by genitally mutilated women than was by non-mutilated women during the first delivery (OR=0.29; CI:0.08,0.92). Moreover, the odds of an infibulated women having used sitzbath was 0.69(CI:0.52,0.93) times lower than a non-infibulated women having used it.

Heavy bleeding during labor was reported to be more common among non-infibulated women than infibulated women during both deliveries (OR=2.39; CI:1.43,4.03 and OR=3.07; CI:1.12,8.55, respectively) with no significant differences found among uncut women. No association was noted between blood transfusion and genital mutilation and there were only 10 women during the first and 3 during the second delivery who were transfused. (Table 8)

During the second delivery, the need for pitocin by women with FGM type III was 2.79(CI:1.27,6.27) times higher than the need by women with FGM type I/II. Intravenous fluid utilization pattern during delivery-one was also found to be significantly different ($p<0.01$) among the three groups of women: 9(7.7%) of uncut, 51(43.6%) of non-infibulated and 57(48.7%) of infibulated women had used IV fluids.

Testing for the likelihood of postnatal birth complications showed that genitally mutilated women were at a lower risk (OR=0.35; CI:0.14,0.83) of having problematic postnatal period than were non-mutilated women during delivery-one; specifically this difference was significant between uncut and FGM type I/II ($p<0.001$) with no significant difference existing between uncut and FGM type III. However, during both deliveries, infibulated mothers were 2.6(CI:1.91,3.55) and

4.96(CI:2.58,9.68) times more likely to report problematic postnatal period than were non-infibulated women. In terms of specific postnatal complications, the numbers of cases under each type of complications were so few (some even 0 & 1) that analysis was practically impossible except for two: postpartum bleeding and wound infection. Heavy bleeding following labor among women having birth for the first time was reported by 6(37.5%) of uncut, 59(59.6%) of non-infibulated and 142(71.0%) of infibulated women. The difference was statistically significant ($p<0.01$). Moreover, the odds of genitally mutilated women having this complication was 3.42(CI:1.08,11.74) times higher than was for non-mutilated women. Following the first delivery, infibulated women were found to be 0.37 (CI: 0.18,0.76) times less likely to develop wound infection than were non-infibulated ones.

Logistic regression of some of the first delivery complications that had significant association with the type of genital mutilation on the bivariate analysis showed that hemorrhage and postnatal complications maintained their statistical significance even after controlling for possible confounders. Regression of labour length on selected confounding variables identified that only birth weight, wealth and distance from the hospital were significant predictors of labour length. Women who were highly wealthy and lived near the hospital (< 30 minutes walk) had significantly lower odds of having prolonged labour, while women who gave birth to big babies had significantly higher odds of having prolonged labour (Table 9). Women who were not thin had significantly lower odds of hemorrhage than were thin women (Table 10). Being illiterate or short (< 150 cms) significantly increased the chance of having complicated postnatal period. Women who had delivered at health institutions or attended by professionals had significantly higher odds of having postnatal problems (Table 11).

Table 8: Relationship between genital mutilation /type and birth complications during the first delivery of the study population, Jijiga Town, Ethiopia, 2002.

Variables	Mutilated, n (%)			OR (95%CI)	Type of FGM, n (%)			OR (95%CI)
	Yes (n=837)	No (n=26)	Total (n=863)		Type III (n=434)	Type I/II (n=399)	Total (n=833)	
Episiotomy (n=843&813)								
No	320(39.2)	9(34.6)	329(39.0)	1.00	165(39.7)	154(38.8)	319(39.2)	1.00
Yes	497(60.8)	17(65.4)	514(61.0)	0.82(0.33,1.98)	251(60.3)	243(61.2)	494(60.8)	0.96(0.72,1.29)
Instrumentation (n=844&814)								
No	764(93.4)	25(96.2)	789(93.5)	1.00	401(94.4)	360(92.5)	761(93.5)	1.00
Yes	54(6.6)	1(3.8)	55(6.5)	1.77(0.28,78.88)	24(5.6)	29(7.5)	53(6.5)	0.74(0.41,1.34)
Cesarean section (n=862&832)								
No	810(96.9)	25(96.2)	835(96.9)	1.00	418(96.3)	388(97.5)	806(96.9)	1.00
Yes	26(3.1)	1(3.8)	27(3.1)	0.80(0.12,34.20)	16(3.7)	10(2.5)	26(3.1)	1.49(0.63,3.56)
Prolonged labor (n=858&828)								
No	644(77.4)	22(84.6)	666(77.6)	1.00	320(74.1)	320(80.8)	640(77.3)	1.00
Yes	188(22.6)	4(15.4)	192(22.4)	1.61(0.54,6.49)	112(25.9)	76(19.2)	188(22.7)	1.47(1.05,2.08)
Heavy bleeding (n=836&807)								
No	732(90.3)	21(84)	753(90.1)	1.00	393(93.8)	335(86.3)	728(90.2)	1.00
Yes	79(9.7)	4(16)	83(9.9)	0.57(0.19,2.33)	26(6.2)	53(13.7)	79(9.8)	0.42(0.25,0.70)
Perineal tear (n=849&819)								
No	740(89.9)	21(80.8)	761(89.6)	1.00	370(87.9)	366(92)	736(89.9)	1.00
Yes	83(10.1)	5(19.2)	88(10.4)	0.47(0.17,1.64)	51(12.1)	32(8)	83(10.1)	1.56(0.97,2.58)
Postnatal problems (n=862&832)								
No	537(64.2)	10(38.5)	547(63.5)	1.00	233(53.8)	300(75.2)	533(64.1)	1.00
Yes	299(35.8)	16(61.5	315(36.5)	0.35(0.14,0.82)	200(46.2)	99(24.8)	299(35.9)	2.6(1.92,3.53)

Table 9: Relationship between prolonged labour during the first delivery and some selected characteristics of the study population (n=646), Jijiga Town, Ethiopia, 2002.

Variables	Prolonged Labour, n (%)			Crude OR (95%CI)	Adjusted OR (95% CI)
	Yes (n=195)	No (n=672)	Total (n=867)		
Type of mutilation (n=828)					
Type III	112(59.6)	320(50)	432(52.2)	1.00	1.00
Type I/II	76(40.4)	320(50)	396(47.8)	0.68(0.48,0.96)	1.02(0.64,1.64)
Age at delivery (n=755)					
< 18	34(20.9)	123(20.8)	157(20.8)	1.00	1.00
≥ 18	129(79.1)	469(79.2)	598(79.2)	1.00(0.64,1.56)	1.12(0.69,1.83)
Education(n=867)					
Illiterate	68(34.9)	234(34.8)	302(34.8)	1.00	1.00
Literate	127(65.1)	438(65.2)	565(65.2)	1.00(0.70,1.41)	1.36(0.85,2.19)
Elementary/Junior	78(61.4)	242(55.3)	320(56.6)	1.00	1.00
Secondary/Higher	49(38.6)	196(44.7)	245(43.4)	0.78(0.51,1.18)	1.04(0.64,1.70)
ANC(n=867)					
Yes	147(75.4)	518(77.1)	665(76.7)	1.00	1.00
No	48(24.6)	154(22.9)	202(23.3)	1.10(0.74,1.64)	1.59(0.85,2.98)
Delivery place (n=866)					
Home	54(27.7)	211(31.4)	265(30.6)	1.00	1.00
H/Institution	141(72.3)	460(68.6)	601(69.4)	1.20(0.83,1.73)	1.65(0.91,2.99)
Delivery assistance (n=862)					
Non-professional	139(71.6)	539(80.7)	678(78.7)	1.00	1.00
Professional	55(28.4)	129(19.3)	184(21.3)	1.65(1.13,2.42)	1.50(0.94,2.39)
Baby's size at birth (n=815)					
≤ Average	90(50.3)	434(68.2)	524(64.3)	1.00	1.00
Big baby	89(49.7)	202(31.8)	291(35.7)	2.12(1.50,3.02)	2.12(1.40,3.20)
Wealth(n=867)					
Low	40(20.5)	96(14.3)	136(15.7)	1.00	1.00
Middle	123(63.1)	403(60.0)	526(60.7)	0.73(0.47,1.14)	0.34(0.16,0.82)
High	32(16.4)	173(25.7)	205(23.6)	0.44(0.25,0.78)	0.53(0.32,0.88)
Risk Height(n=845)					
Yes	27(14.2)	89(13.6)	116(13.7)	1.00	1.00
No	163(85.8)	566(86.4)	729(86.3)	0.95(0.58,1.55)	0.72(0.41,1.26)
Thinness(n=840)					
Yes	18(9.6)	77(11.8)	95(11.3)	1.00	1.00
No	170(90.4)	575(88.2)	745(88.7)	1.26(0.72,2.26)	0.96(0.51,1.80)
Hospital Distant (n=867)					
Yes	105(53.8)	253(37.6)	358(41.3)	1.00	1.00
No	90(46.2)	419(62.4)	509(58.7)	0.52(0.37,0.72)	0.55(0.35,0.86)

Table 10: Relationship between hemorrhage during the first delivery and some selected characteristics of the study population (n=646), Jijiga Town, Ethiopia, 2002.

Variables	Heavy Bleeding, n (%)			Crude OR (95%CI)	Adjusted OR (95% CI)
	Yes (n=83)	No (n=762)	Total (n=845)		
Type of mutilation (n=807)					
Type III	26(32.9)	393(54)	419(51.9)	1.00	1.00
Type I/II	53(67.1)	335(46)	388(48.1)	2.39(1.43,4.03)	2.84(1.34,6.01)
Age at delivery (n=738)					
< 18	9(12.7)	147(22)	156(21.1)	1.00	1.00
≥ 18	62(87.3)	520(78)	582(78.9)	1.95(0.91,4.31)	2.01(0.88,4.59)
Education(n=845)					
Illiterate	27(32.5)	263(34.5)	290(34.3)	1.00	1.00
Literate	56(67.5)	499(65.5)	555(65.7)	1.09(0.66,1.82)	0.99(0.50,1.95)
Elementary/Junior	31(55.4)	287(57.5)	318(57.3)	1.00	1.00
Secondary/Higher	25(44.6)	212(42.5)	237(42.7)	1.09(0.60,1.97)	0.93(0.48,1.80)
ANC(n=845)					
Yes	64(77.1)	586(76.9)	650(76.9)	1.00	1.00
No	19(22.9)	176(23.1)	195(23.1)	0.99(0.56,1.74)	1.72(0.75,3.90)
Delivery place (n=844)					
Home	21(25.3)	240(31.5)	261(30.9)	1.00	1.00
H/Institution	62(74.7)	521(68.5)	583(69.1)	1.36(0.79,2.36)	1.45(0.64,3.29)
Delivery assistance (n=840)					
Non-professional	61(73.5)	609(80.4)	670(79.8)	1.00	1.00
Professional	22(26.5)	148(19.6)	170(20.2)	1.48(0.85,2.56)	1.90(0.97,3.72)
Baby's size at birth (n=797)					
≤ Average	52(65)	464(64.7)	516(64.7)	1.00	1.00
Big baby	28(35)	253(35.3)	281(35.3)	0.99(0.59,1.64)	1.15(0.63,2.10)
Wealth(n=845)					
Low	11(13.3)	119(15.6)	130(15.4)	1.00	1.00
Middle	59(71.1)	460(60.4)	519(61.4)	1.39(0.68,2.89)	0.32(0.08,1.29)
High	13(15.7)	183(24)	196(23.2)	0.77(0.31,1.91)	0.48(0.22,1.02)
Risk Height(n=824)					
Yes	10(12.5)	106(14.2)	116(14.1)	1.00	1.00
No	70(87.5)	638(85.8)	708(85.9)	1.16(0.56,2.48)	0.98(0.43,2.26)
Thinness(n=819)					
Yes	17(21.5)	74(10.0)	91(11.1)	1.00	1.00
No	62(78.5)	666(90.0)	728(88.9)	0.41(0.22,0.76)	0.33(0.17,0.66)
Hospital Distant (n=845)					
Yes	25(30.1)	323(42.4)	348(41.2)	1.00	1.00
No	58(69.9)	439(57.6)	497(58.8)	1.17(1.02,2.87)	1.83(0.85,3.92)

Table 11: Relationship between complicated postnatal period during the first delivery and some selected characteristics of the study population (n=663), Jijiga Town, Ethiopia, 2002.

Variables	Postnatal Problems, n (%)			Crude OR (95%CI)	Adjusted OR (95% CI)
	Yes (n=315)	No (n=556)	Total (n=871)		
Type of mutilation (n=832)					
Type III	200(66.9)	233(43.7)	433(52.0)	1.00	1.00
Type I/II	99(33.1)	300(56.3)	399(48.0)	0.38(0.28,0.52)	0.45(0.30,0.68)
Age at delivery (n=759)					
< 18	72(26.7)	86(17.6)	158(20.8)	1.00	1.00
≥ 18	198(73.3)	403(82.4)	601(79.2)	0.59(0.40,0.85)	0.80(0.52,1.20)
Education (n=871)					
Illiterate	145(46)	159(28.6)	304(34.9)	1.00	1.00
Literate	170(54)	397(71.4)	567(65.1)	0.47(0.35,0.63)	0.43(0.29,0.64)
Elementary/Junior	100(58.8)	221(55.7)	321(56.6)	1.00	1.00
Secondary/Higher	70(41.2)	176(44.3)	246(43.4)	0.88(0.60,1.29)	1.28(0.80,2.05)
ANC (n=871)					
Yes	226(71.7)	443(79.7)	669(76.8)	1.00	1.00
No	89(28.3)	113(20.3)	202(23.2)	1.54(1.11,2.15)	1.72(0.99,2.99)
Delivery place(n=870)					
Home	90(28.6)	176(31.7)	266(30.6)	1.00	1.00
H/Institution	225(71.4)	379(68.3)	604(69.4)	1.16(0.85,1.59)	2.19(1.29,3.75)
Delivery assistant (n=866)					
Non-professional	221(70.8)	458(82.7)	679(78.4)	1.00	1.00
Professional	91(29.2)	96(17.3)	187(21.6)	1.19(1.40,2.77)	1.87(1.23,2.85)
Baby's size at birth (n=819)					
≤ Average	168(58.5)	359(67.5)	527(64.3)	1.00	1.00
Big baby	119(41.5)	173(32.5)	292(35.7)	1.14(1.08,2.00)	1.04(0.72,1.51)
Wealth (n=871)					
Low	60(19.1)	77(13.8)	137(15.7)	1.00	1.00
Middle	172(54.6)	357(64.2)	529(60.7)	0.62(0.41,0.92)	1.67(0.81,3.43)
High	83(26.3	122(21.9)	205(23.6)	0.87(0.55,1.39)	1.28(0.86,1.92)
Risk Height (n=849)					
Yes	54(17.6)	64(11.8)	118(13.9)	1.00	1.00
No	252(82.4)	479(88.2)	731(86.1)	0.62(0.41,0.94)	0.57(0.34,0.94)
Thinness (n=844)					
Yes	32(10.5)	64(11.9)	96(11.4)	1.00	1.00
No	272(89.5)	476(88.1)	748(88.6)	1.14(0.71,1.84)	1.19(0.68,2.08)
Hospital Distant (n=871)					
Yes	143(45.4)	215(38.7)	358(41.1)	1.00	1.00
No	172(54.6)	341(61.3)	513(58.9)	0.76(0.57,1.01)	0.95(0.63,1.44)

VI. DISCUSSION

The practice of female genital mutilation is a very deeply rooted harmful tradition that dates back centuries in most African and some Arabian countries. Apart from being a form of violence against females it has debilitating and long lasting health hazards. Its ill-effects are associated with the very nature of the practice. It is interference to a normal human body part on the one hand and it is mostly performed in an unhygienic environment by a person who is illiterate to the anatomy of the female genitalia on the other. In addition, unintended damage is often caused because of the crude tools, poor light, and poor eyesight of the practitioner compounded by the struggles of the girls or women during the procedure.

For a variety of reasons people at different corners of the world are practicing it. In our study area, 97% of the women interviewed had undergone the operation with some 52% of them severely mutilated with the most devastating type of FGM – infibulation. The prevalence figure is consistent with the one reported in the DHS 2000 of Ethiopia (9). However, the proportion of women with FGM Type III is very much lower than that reported for the region. This is because this type is mainly practiced by Somalis who are the major ethnic group of the region but the study area, being the capital of the region, is ethnically composed of others as well. According to the 1997 census more than 35% of inhabitants of Jijiga town were non-Somalis (28). In our study the non-Somali respondents were over-represented at 58%. The literacy rate (65%) among women of the study was high when compared to national as well as regional figures (9, 30). This could be so because the majority of study subjects were young and dwelled in the town.

Like other studies, the main factor determining the prevalence of the practice was Muslim religion. Education and place of birth (residence) failed to show significant effect in the prevalence of FGM since the study area is a high prevalence area. Similar findings were observed in the DHS that included six African countries (11). In this study, women's occupation was found to significantly affect the prevalence of female genital mutilation. However, this differential per se could not be the reason for a woman not to be a victim since the women were genitally mutilated at early age. The occurrence of infibulation was significantly associated with being Muslim and Somali, a finding consistent with the geographic distribution of this type of genital mutilation (1, 2).

Women in polygamous union were significantly found to report infibulation. One possibility is that husbands who are married to infibulated women may have had unsatisfying relationships that drive them to another marriage. Shandall studied 4024 women from his outpatient clinic in northern Sudan and reported that over 80% of women with Type III genital mutilation did not know of or experience orgasm, compared to around 10% of those with Type I or who were "uncircumcised" (21). El Dareer conducted a national survey, also in north Sudan, and reported similar results (39). Karim and Ammar studied 331 genitally mutilated women who attended their clinic in Cairo (40). Although not conclusive because all types were represented in lump, 29% did not experience any sexual satisfaction during intercourse, 30% experienced some satisfaction but did not reach orgasm and 41% experienced satisfaction and orgasm frequently. In Egypt, men had claimed that their excessive alcohol or hashish consumption was because they did not find sex satisfying with their mutilated wives (41). Shandall interviewed 300 polygamous men among whose wives only one was infibulated while the others were non-mutilated or had undergone type I (21). Some 266 of the men (88.7%) preferred the latter to the former and 60

(20%) had married their second wives only because “they could not keep up with the ordeal of perforating the progressively toughening scars of their wives every time they had babies”. Only 36 men (12%) maintained that coitus with an infibulated wife was enjoyable.

Women from wealthier parents reported significantly higher protection from genital mutilation. This could be because economically well-off families were less likely to adhere to the tradition of FGM but this observation was contrary to most studyies’ findings which showed that the practice of FGM is independent of economic status (11, 16). However, women whose parents were in the high wealth score reported infibulation 2 times more commonly than women whose parents were in the low wealth score. Here, well to do families are adhering to an identifying tradition. In the study area, infibulation-locally called "pharonic circumcision"- is an identifying tradition practiced even by some non-Somali ethnic personalities. Another reason could be the cost of the mutilation. Infibulation has both direct cost paid to the circumciser and indirect costs expended in the rituals associated with the practice and days lost by the girls since they remain tied up just above the knee for some two weeks until the wound heals in fusion.

The median age at mutilation was found to be 7 days for non-infibulated and 7 years for infibulated women. This is consistent with the finding by other researchers (11,12,13,14,15). Most respondents were operated on by traditional circumcisers and traditional birth attendants, similar to the findings in the DHS 2000 of Ethiopia (9).

The majority of respondents were primigravid and primiparous women. This is because of the restriction of selection of the study subjects for reasons of recall bias. Infibulated women reported experience of more than one abortion almost 4 times more commonly than did non-infibulated women. This could be due to psychological effect of the mutilation since infibulated women have

a sense of deep fear of pregnancy and childbirth (4). The overall stillbirth rate (5.3%) was very small compared to most reproductive health studies in developing world. The short reproductive life of study subjects could be one reason. Stillbirth was reported more commonly by infibulated women than was by non-infibulated women. Soft tissue dystocia due to scarring could be one of the reasons.

Knowledge about health hazards of FGM was significantly predicted by being Christian, educated, and born in urban settings. The same findings were observed by a study in Sudan (32). Muslims, Somalis and uneducated women were more likely supporters of continuation of the practice. Women living in a wealthier household more commonly opposed continuation. In the study mentioned just above, multivariate logistic regression analysis also identified women's education, religion, and household possession score as significant predictors of attitude towards female genital mutilation. Infibulation was preferred by Muslims, Somalis, and women born in rural setting. Contrary to the observation that relates parents of women (older generation) to infibulating type of mutilation, women living in wealthier household were less likely to prefer infibulation over non-infibulation. This could be a sign of the newer generation preferring the less damaging type of mutilation. In this study it was also found that the practices or the plans for practice were the exact reflections of women's attitude towards FGM. In addition it was found that the women generally lack the knowledge about health risks of the practice. This was particularly prominent among women whose attitude is positive for the practice. Moreover, the knowledge deficit was also high among women who had genitally mutilated or who were planning to mutilate their daughter. This clearly has a program implication in the struggle to abolish the practice.

In most studies the reasons given for maintaining the practice were found to be no other than the ones found in this study: good tradition/custom and religious demand. The reasons for not supporting the continuation of the practice were also similar: medical complication and religious prohibition. It was very ironic to find the most appealing entity of human life-religion-at the cross road of such devastating phenomenon. In fact the words in both Holy books of Muslim and Christian are of condemnation in type despite the prevailing misconception of the majority of women. If properly cultivated this is also a ripe area for intervention by way of health education that involves religious leaders.

The ANC coverage in general and the proportion of women who visited the care centers for four or more times were very promising. The higher literacy rate and young study population could have contributed for this finding. The ANC attendance was shown to be significantly associated with women's education and wealth. Infibulated women were found to avoid ANC although this was not statistically significant on the multivariate analysis. Difficulty during pelvic examination and fear of digital examination itself may stimulate such women not to attend ANC (4). Infibulated women were also found to avoid delivering at health institution significantly. One explanation is their concern that they would not get the chance of re-infibulation at the institution. Traditional birth attendants could be very cooperative in this regard. Other factors found to be significantly associated with home deliveries were being illiterate and living in low wealth score household.

The most common birth complication reported by mutilated women who were delivering for the first time was episiotomy (61%) followed by complicated postnatal period (36%), findings in line with most other studies (1,8,17,27). The cesarean and instrumental delivery rates are on the lower

side. The occurrence of almost all obstetric complications decreased with parity. The proportion of women with prolonged labour increased from 23% during the first-time deliveries to 40% during the second-time deliveries. This is contrary to other studies (17) which showed that the length of labour was shorter in subsequent deliveries following the first deliveries.

In this study, the most significant delivery complications that are associated with FGM are heavy bleeding and postnatal complications. Contrary to other findings bleeding was significantly associated with the less severe form of mutilation-FGM type I/II. The most plausible explanation for this may be the timing of the episiotomy. All infibulated women are cut open early during their delivery to allow the passage of the descending fetal head, and this may decrease the chance of having perineal tears that contribute to hemorrhage. However, the occurrence of post partum hemorrhage was significantly higher among mutilated women than non-mutilated women. Post natal period were commonly smoother for non-infibulated women than were for infibulated women. Prolonged labour as a complication of genital mutilation in general and infibulation in particular is commonly found in the literature (17, 20, 21, 26). Although this was also found in this study, it was not significant on the multivariate analysis.

VII. STRENGTHS AND LIMITATIONS OF THE STUDY

The study employed a random sample of women of reproductive age group which can represent women of Jijiga town. Information regarding deliveries was limited to the first two deliveries of a woman where by aggregate information across deliveries was avoided. Recall period of five years in connection with the most unforgettable event of a woman; i.e., the first delivery, was not in general that long. The additional development of instrument in the local language of Somali and its administration by the same has the advantage of improved data quality.

Although the study has tried to improve the validity and reliability of the information generated, it has its own limitations. The study was based on respondents' self-reporting of both the type of genital mutilation and birth complications. In this regard certain types of genital mutilation and complication may have been underreported or over-reported. One study in Sudan found some discrepancies between the type of genital mutilation women had undergone and the type they reported (42). However, the categorization of the types of female genital mutilation into those who were sewn and not sewn could have helped respondents in responding the true nature of their genital mutilation. Moreover, because all women were asked the same questions in the same way, the results remain indicative of the differential experiences of infibulated versus non-infibulated women. Social desirability bias is a possibility since in the study area the practice is considered to be culturally good.

To ensure the validity and reliability of the information generated by this study reliability was checked during pre-testing and actual data collection, data were compared with findings of other similar studies and some variables were counter checked with each other. Results were compared

with findings from similar studies in other African countries and surveys in Ethiopia as a means of validating the content indirectly. Female data collectors were also used to avoid possible bias and in a way decrease non-response rate.

Because of the cross-sectional nature of the study, the findings should be interpreted with some caution and replication of the results in longitudinal studies is highly desirable. All results reported with regard to genitally mutilated versus non-mutilated women were based on such a small sample of genitally non-mutilated women that the precision with which the difference was observed was questionable.

The lack of literature in the country for comparison should be considered and the outcomes of this study are believed to be a contribution, however small, towards this cause.

VIII. CONCLUSION AND RECOMMENDATIONS

Based on the results and considering the limitations of the study it is possible to conclude that the prevalence of female genital mutilation was very high (97%) in Jijiga town and it goes without saying that with such alarming occurrence and the possible health consequences attached, it is a major public health problem.

The practices of infibulation as well as genital mutilation in general were highly associated with Muslim religion and the majority of women had the perception of their religion demanding it. Female genital infibulation may perpetuate another harmful traditional practice of polygamy for the most likely reason of decreased sexual satisfaction. Non-infibulating genital mutilation was performed early during the neonatal period while infibulation was performed on a girl aged about seven years.

Knowledge about the health effects of FGM was on the lower side in general but it was significantly deficient among women who had positive attitude for the practice and among those who planned to mutilate or mutilated their daughters. Moreover, knowledgeable women advocated the less severe form of genital mutilation despite the choice was between two evils. These are indications that women's lack of knowledge about the health hazards of FGM contribute to the perpetuation of the practice. In addition education was found to be a significant predictor of favorable knowledge about and negative attitude towards female genital mutilation.

The practice of infibulation was found to have a negative impact on the reproductive health behaviors of women. It was also found to be associated with increased occurrence of some birth complications.

Therefore the following recommendations are forwarded in line with what has been found in this study:

- The regional health bureau and other related sectors of the region responsible for the health of the people of the region should take the magnitude of the problem and its health implications seriously and initiate activities against the practice of female genital mutilation.
- There is a clear need to disseminate information, generate internal discussion and present the basic health and religious facts in an accessible manner. Women's reasons given for favoring discontinuation of FGM (such as medical complication, painful personal experiences and sexual dissatisfaction) and the fact that female genital mutilation is not obligatory under Islamic law (by involving religious leaders) can be used in mass media campaigns and educational forum. The greater health risks associated with FGM Type III should be emphasized and publicized through local media. Men should also be involved in the campaign with their side of the story by publicizing the effect of infibulation on sexual satisfaction and hence marital relationships.
- Substantial change in women's attitudes are likely to occur only through improvement of their status in society since the prevailing socioeconomic dependence of women on men in most of the African society, including Ethiopia, limits their ability to oppose female genital mutilation.

- Since FGM is a deeply rooted, multifaceted social practice, there should be a concerted effort by the government, religious leaders, community and women's leaders, non-governmental organizations and international agencies against the practice.

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ANNEX 1: QUESTIONNAIRE OF THE SURVEY

DEPARTMENT OF COMMUNITY HEALTH
FACULTY OF MEDICINE
ADDIS ABABA UNIVERSITY

Questionnaire Developed for a Study on Female Genital Mutilation and Birth Complications among Women of Reproductive Age Who had Their First Birth within the Last Five Years.
Somali National Regional State
Jijiga Town

001 QUESTIONNAIRE IDENTIFICATION NUMBER [___/___/___]

002 WEREDA _____

003 KEBELE _____

004 HOUSE NUMBER _____

Introduction: "My name is …… I am working with a study group from AAU and MOH. We are interviewing women living in this kebele whose age is between 15 and 49 in order to find out people's knowledge and attitude about female genital mutilation and its health effects, and the occurrence of these health impacts among these women. The purpose of the study is to gather information relevant to Jijiga and useful for the planning of appropriate interventions and health care plans. Therefore, your honest and genuine participation by responding to the questions prepared is highly appreciated and credited."

Confidentiality and consent: "I am going to ask you some very personal questions. Your answers are completely confidential. Your name will not be written on this form, and will never be used in connection with any of the information you tell me. You do not have to answer any questions that you do not want to answer, and you may end this interview at any time you want to. However, your honest answer to these questions will help us better understand the situation. We would greatly appreciate your help in responding to this survey. The survey will take about 30 - 40 minutes to be completed. Would you be willing to participate?"

1. Yes
2. No

_____
(Signature of interviewer certifying that informed consent has been given verbally by respondent)

Interviewer visit:

	Visit 1	Visit 2	Visit 3
Date			
Interviewer			
Result			

Result codes: Completed 1; Respondent not available 2; Refused 3; Partially completed 4; Other 5

Section I: Background characteristics

First, I would like to ask you some general questions about you and your parents!				
S.No	**Questions and filters**	**Coding categories**	**Skip to**	**Code**
Q101	In what month and year were you born? **Use Gregorian calendar**	Month [___/___] Don't Know Month No Response Year [___/___] Don't Know Year No Response		
Q102	How old were you at your last birthday? **Compare/reconcile Q101 & 102 if needed**	Age in completed years [___/___] Don't Know No Response **Approximate age should be filled**		
Q103	What is your religion?	Orthodox 1 Muslim 2 Catholic 3 Protestant 4 Traditional 5 No Religion 6 Others (Specify)_____ 7 No Response 99		
Q104	What is your ethnicity?	Somali 1 Amhara 2 Oromo 3 Tigrawi 4 Gurage 5 Other (Specify)_____ 6 No Response 99		
Q105	Have you ever attended school? {Or Did you have any schooling?}	Yes 1 No 2 No Response 99	→ Q107	
Q106	What is the highest level of school you reached?	Read and write 1 Grade 1-6 2 Grade 7-8 3 Grade 9-12 4 Above grade 12 5 No Response 99		
Q107	Has either of your parents ever attended school? {Or Did either of your parents have any schooling?}	Yes, father only 1 Yes, mother only 2 Yes, both 3 None 4 Don't Know 88 No Response 99	→ Q109 → Q109	

S.No	Questions and filters	Coding categories	Skip to	Code
Q108	What is the highest level of school they reached? **Mark only one for each!**	Father Mother Read and write _____ _____ 1 Grade 1-6 _____ _____ 2 Grade 7-8 _____ _____ 3 Grade 9-12 _____ _____ 4 Above grade 12 _____ _____ 5 Don't Know _____ _____ 88 No Response _____ _____ 99		
Q109	Where were you born?	Urban 1 Rural 2 Don't Know 88 No Response 99		
Q110	What is your marital status?	Never Married 1 Married/Living as married 2 Divorced 3 Separated 4 Widowed 5 No Response 99	→ Q114	
Q111	How old were you when you first got married?	Age in years [___/___] Don't Know No Response		
Q112	Does/Did your husband have other wife/wives?	Yes 1 No 2 Don't Know 88 No Response 99		
Q113	What do you do for living? {Or What is your occupation?}	Housewife 1 Civil Servant 2 Merchant 3 Student 4 Daily Laborer 5 House maid 6 Other (Specify) _____ 7 No Response 99		
Q114	How much is the average family income per month?	Less than 100 Birr 1 100 - 299 Birr 2 300 - 500 Birr 3 More than 500 Birr 4 Unknown 5 No Response 99		
Q115	What is your family size?	Size in number [___/___] No Response		
Q116	How many brothers and sisters do you have? (Same father and mother)	Their number [___/___] No Response		

S.No	Questions and filters	Coding categories					Skip to	Code
Q117	What is your father's occupation?	Farmer				1		
		Civil Servant				2		
		Merchant				3		
		Driver				4		
		Daily Laborer				5		
		Soldier/ex-soldier				6		
		Jobless				7		
		Other (Specify) _____				8		
		No Response				99		
Q118	What is your mother's occupation?	Housewife				1		
		Civil Servant				2		
		Merchant				3		
		Daily Laborer				4		
		House maid				5		
		Other (Specify) _____				6		
		No Response				99		
Q119	Do you have any of these?		Yes	No	DK	NR		
		Radio	1	2	3	99		
		Television	1	2	3	99		
		Refrigerator	1	2	3	99		
	Read out lists!	Cot	1	2	3	99		
	Mark 1 for haves and 2 for don't haves!	Bicycle	1	2	3	99		
		Car	1	2	3	99		
	Multiple answers possible!	Electricity	1	2	3	99		
		Safe drinking water	1	2	3	99		
		Sanitation facilities	1	2	3	99		
		Brick cement/concrete house	1	2	3	99		
Q120	Did your parents have any of these?		Yes	No	DK	NR		
		Radio	1	2	3	99		
		Television	1	2	3	99		
		Refrigerator	1	2	3	99		
		Cot	1	2	3	99		
	Read out lists!	Bicycle	1	2	3	99		
	Mark 1 for haves and 2 for don't haves!	Car	1	2	3	99		
		Electricity	1	2	3	99		
	Multiple answers possible!	Safe drinking water	1	2	3	99		
		Sanitation facilities	1	2	3	99		
		Brick cement/concrete house	1	2	3	99		
Q121	What is your parents' religion?	Orthodox				1		
		Catholic				2		
		Protestant				3		
		Muslim				4		
		Traditional				5		
	Circle two options for parents with different religion!	No Religion				6		
		Others (Specify)_____				7		
		No Response				99		

Section II: Reproductive History

Now we will move on to more personal questions about you and your pregnancy/childbirth!				
S.No	**Questions and filters**	**Coding categories**	**Skip to**	**Code**
Q201	How many times have you been pregnant? (Gravidity)	Only once 1 2 - 4 times 2 5 and above 3 No Response 99		
Q202	What was your age at your first pregnancy?	Age in years [___/___] Don't Know No Response		
Q203	How many times did you give birth? (Parity) {Or How many children have you had?}	Number of times [___/___] No Response		
Q204	How many of your children are alive?	Number alive [___/___] No Response		
Q205	How old is your first child?	Age in months [___/___] No Response		
Q206	Did you ever have a still birth?	Yes 1 No 2 No Response 99	→ Q209	
Q207	How many times did you have still births?	Number of times [___/___] No Response		
Q208	What was the gestational age of the still birth(s)?	1st 2nd 3rd Seven month __ __ __ 1 Eight month __ __ __ 2 Nine month __ __ __ 3 Don't Know __ __ __ 88 No Response __ __ __ 99		
Q209	Did you ever have miscarriage/ abortion?	Yes 1 No 2 No Response 99	→ Q212	
Q210	How many times did you have abortions?	Number of times [___/___] No Response		
Q211	What was the gestation of the abortion?	1st 2nd 3rd First trimester __ __ __ 1 Second trimester __ __ __ 2 Don't Know __ __ __ 88 No Response __ __ __ 99		
Q212	Are you circumcised?	Yes 1 No 2 Don't Know 88 No Response 99	→ Q301	

S.No	Questions and filters	Coding categories	Skip to	Code
Q213	How old were you at the time of your circumcision?	Age in years [___/___] Don't Know No Response		
Q214	Which type of circumcision do you think was performed on you?	Infibulation 1 Excision/Clitoridectomy (Sunna) 2 Others (Specify) _____ 3 Don't Know 88 No Response 99		
Q215	Who did the operation?	TBA 1 Midwife 2 Nurse 3 Physician 4 Other (Specify)_____ 5 Don't Know 88 No Response 99		

Section III: Attitude towards female genital mutilation

S.No	Questions and filters	Coding categories	Skip to	Code
Q301	Do you have a girl child?	Yes 1 No 2 No Response 99	→ Q303	
Q302	Are you planning to circumcise her?	Yes 1 No 2 Don't Know 88 No Response 99		
Q303	Do you think female circumcision is a good practice?	Yes 1 No 2 No Response 99		
Q304	Do you know that female circumcision can cause health problems?	Yes 1 No 2 No Response 99		
Q305	Do you think female circumcision should continue?	Yes 1 No 2 No Response 99	→ Q307	
Q306	Which type of female circumcision would you prefer to continue?	Infibulation 1 Excision/Clitoridectomy (Sunna) 2 Others (Specify) _____ 3 No Response 99		
Q307	Why do you think it should continue? **Probe for more!** **Multiple answers possible!**	Good tradition 1 Good Custom 2 Religious demand 3 Cleanliness 4 Better marriage prospects 5 Greater pleasure of husband 6 Preservation of virginity 7 Prevention of immorality 8 Increased fertility 9 Never thought about reason 10 Others (Specify) _____ 11 No Response 99		

S.No	Questions and filters	Coding categories	Skip to	Code
Q308	Why do you think it should not continue? **Probe for more!** **Multiple answers possible!**	Religious prohibition 1 Sexual dissatisfaction 2 Medical complication 3 Painful personal experience 4 Against human rights/woman's dignity 5 Causes infertility 6 Others (Specify) _____ 7 No Response 99		
Q309	What is your husband's opinion about the continuation of female circumcision?	Favor 1 Oppose 2 No opinion 3 Don't Know 88 No Response 99		
Q310	What do you think is the best way to stop female circumcision? **Probe for more!** **Multiple answers possible!**	Enforced legislation 1 Educational campaign to women 2 Improvement of status of women 3 Fathers should take more responsibility 4 Sexual education 5 Others (Specify)_____ 6 No Response 99		

Section IV: A first pregnancy that ended in delivery

Now I am going to ask you some specific questions pertaining your first pregnancy and delivery; so think of those particular times!

S.No	Questions and filters	Coding categories	Skip to	Code
Q401	Did you go for antenatal care during your first pregnancy?	Yes 1 No 2 Don't remember 88 No Response 99	→ Q407	
Q402	Where did you go for the antenatal care?	Hospital 1 Health center 2 MCH clinic 3 Private clinic 4 Don't remember 88 No Response 99		
Q403	What month of pregnancy was your first visit?	Months of pregnancy [___/___] Don't remember No Response		
Q404	Why did you first attend the antenatal care?	Routine check up 1 Problem with pregnancy 2 Vaccination 3 Others (Specify) _____ 4 Don't remember 88 No Response 99	→ Q405 Otherwise go toQ406	
Q405	What was the problem?	Problem [_____] Don't know 88 No Response 99		
Q406	How many times in total did you go for antenatal care during this first pregnancy?	Only once 1 Two times 2 Three times 3 More than three times 4 Don't remember 88 No Response 99		

S.No	Questions and filters	Coding categories	Skip to	Code
Q407	Did you have any of the following during this first pregnancy? **Read out options!** **Multiple answers possible!**	Diabetes mellitus 1 Hypertension 2 Fits 3 Vaginal bleeding 4 Febrile illnesses 5 Jaundice 6 Swelling of the face 7 Cardiac problems 8 I had none of these 9 Others (Specify) _____ 10 No Response 99		
Q408	Where did you deliver your first baby? {Or Where did you have your first child?}	Hospital/health center/clinic 1 Home 2 No Response 99		
Q409	Was the delivery at the expected time?	Term 1 Preterm 2 Post term 3 Don't know 88 No Response 99		
Q410	Who assisted you during the delivery?	Gynecologist/obstetrician 1 General practitioner 2 Nurse or Midwife 3 TBA 4 Relative/Friend (non-TBA) 5 I delivered on my own 6 Don't know 88 No Response 99		
Q411	Did they cut your vagina open to help the baby out? {Or Did you have episiotomy?}	Yes 1 No 2 Don't know 88 No Response 99	→ Q413	
Q412	What do you think was the reason?	Reason [_____ _____] Don't know 88 No Response 99		
Q413	Did they use instruments to help the baby out? (forceps or vacuum)	Yes 1 No 2 Don't know 88 No Response 99	→ Q415	
Q414	What do you think was the reason?	Reason [_____ _____] Don't know 88 No Response 99		
Q415	Was IV fluid used just before or during the labor?	Yes 1 No 2 Don't know 88 No Response 99		
Q416	Was Pitocin used just before or during the labor?	Yes 1 No 2 Don't know 88 No Response 99		

S.No	Questions and filters	Coding categories		Skip to	Code
Q417	What part of the baby came out first?	The head	1		
		The breech	2		
		Limb(s)	3		
		The shoulder	4		
		Other (Specify) _____	5		
		Don't know	88		
		No Response	99		
Q418	Did they C/section you to bring the baby out?	Yes	1		
		No	2	→ Q420	
		No Response	99		
Q419	What do you think was the reason?	Reason [_____]			
		Don't know	88		
		No Response	99		
Q420	What was the outcome of the labor?	Alive and healthy baby	1		
		Alive but sick baby	2		
		Dead baby	3		
		No Response	99		
Q421	How did you estimate the weight of the baby at birth?	Very small	1		
		Small	2		
		Normal/Average	3		
		Big	4		
		Very big	5		
		Weight in Kg _____	6		
		Don't know	88		
		No Response	99		
Q422	How long did this first labor last?	One day or one night	1		
		A day/a night and a half	2		
		A day and a night	3		
		Two days and a night	4		
		Two days and two nights	5		
		More than options	6		
		Don't know	88		
		No Response	99		
Q423	How long after the birth of the child was the placenta delivered?	Less than 30 minutes	1		
		30 minutes -1 hour	2		
		More than 1 hour	3		
		Don't know	88		
		No Response	99		
Q424	Were any instruments or manipulations used to help the delivery of the placenta?	Yes	1		
		No	2		
		Don't know	88		
		No Response	99		
Q425	Did you have any genital trauma? (perineal tearing/lacerations)	Yes	1		
		No	2		
		No Response	99		
Q426	Did you use any sitz bath drugs or warm salt water at home?	Yes	1		
		No	2		
		No Response	99		
Q427	How was your bleeding during and just after the labor?	Wet my clothes	1		
		Wet the bed	2		
		Wet the floor	3		
		Don't know	88		
		No Response	99		

S.No	Questions and filters	Coding categories	Skip to	Code
Q428	Did you receive any blood transfusion?	Yes 1 No 2 Don't know 88 No Response 99	→ Q430	
Q429	How many bags of blood were you transfused?	Number of bags [___/___] Don't know No Response		
Q430	Did you have any of the following problems after the completion of the labor? **Readout lists!** **Multiple answers possible!**	Excessive vaginal bleeding 1 Foul smelling vaginal discharge 2 Urine leakage wetting the underwear 3 Stool leakage through the vagina 4 Febrile illness 5 Wound infection 6 Don't know 88 No Response 99		

Section V: A second pregnancy that ended in delivery

Now I am going to ask you some specific questions pertaining your second pregnancy and delivery; so think of those particular times!

S.No	Questions and filters	Coding categories	Skip to	Code
Q501	Did you have a second pregnancy that ended in a term delivery?	Yes 1 No 2 No Response 99	→ Q601	
Q502	Did you go for antenatal care during your second pregnancy?	Yes 1 No 2 Don't remember 88 No Response 99	→ Q508	
Q503	Where did you go for the antenatal care?	Hospital 1 Health center 2 MCH clinic 3 Private clinic 4 Don't remember 88 No Response 99		
Q504	What month of pregnancy was your first visit?	Months of pregnancy [___/___] Don't remember No Response		
Q505	Why did you first attend the antenatal care?	Routine check up 1 Problem with pregnancy 2 Vaccination 3 Others (Specify) _____ 4 Don't remember 88 No Response 99	→ Q506 Otherwise go toQ507	
Q506	What was the problem?	Problem [_____] Don't know 88 No Response 99		
Q507	How many times in total did you go for antenatal care during this second pregnancy?	Only once 1 Two times 2 Three times 3 More than three times 4 Don't remember 88 No Response 99		

S.No	Questions and filters	Coding categories	Skip to	Code
Q508	Did you have any of the following during this second pregnancy? **Read out options!** **Multiple answers possible!**	Diabetes mellitus 1 Hypertension 2 Fits 3 Vaginal bleeding 4 Febrile illnesses 5 Jaundice 6 Swelling of the face 7 Cardiac problems 8 None of these 9 Others (Specify) _____ 10 No Response 99		
Q509	Where did you deliver this second baby? {Or Where did you have your second child?}	Hospital/health center/clinic 1 Home 2 No Response 99		
Q510	Was the delivery at the expected time?	Term 1 Preterm 2 Post term 3 Don't know 88 No Response 99		
Q511	Who assisted you during the delivery?	Gynecologist/obstetrician 1 General practitioner 2 Nurse or Midwife 3 TBA 4 Relative/Friend (non-TBA) 5 I delivered on my own 6 Don't know 88 No Response 99		
Q512	Did they cut your vagina open to help the baby out? {Or Did you have episiotomy?}	Yes 1 No 2 Don't know 88 No Response 99	→ Q514	
Q513	What do you think was the reason?	Reason [_____ _____] Don't know 88 No Response 99		
Q514	Did they use instruments to help the baby out? (forceps or vacuum)	Yes 1 No 2 Don't know 88 No Response 99	→ Q516	
Q515	What do you think was the reason?	Reason [_____ _____] Don't know 88 No Response 99		
Q516	Was IV fluid used just before or during the labor?	Yes 1 No 2 Don't know 88 No Response 99		
Q517	Was Pitocin used just before or during the labor?	Yes 1 No 2 Don't know 88 No Response 99		

S.No	Questions and filters	Coding categories		Skip to	Code
Q518	What part of the baby came out first?	The head	1		
		The breech	2		
		Limb(s)	3		
		The shoulder	4		
		Other (Specify) _____	5		
		Don't know	88		
		No Response	99		
Q519	Did they C/section you to bring the baby out?	Yes	1		
		No	2	→ Q521	
		No Response	99		
Q520	What do you think was the reason?	Reason [_____]			
		Don't know	88		
		No Response	99		
Q521	What was the outcome of the labor?	Alive and healthy baby	1		
		Alive but sick baby	2		
		Dead baby	3		
		No Response	99		
Q522	How did you estimate the weight of the baby at birth?	Very small	1		
		Small	2		
		Normal/Average	3		
		Big	4		
		Very big	5		
		Weight in Kg _____	6		
		Don't know	88		
		No Response	99		
Q523	How long did this second labor last?	One day or one night	1		
		A day/a night and a half	2		
		A day and a night	3		
		Two days and a night	4		
		Two days and two nights	5		
		More than options	6		
		Don't know	88		
		No Response	99		
Q524	How long after the birth of the child was the placenta delivered?	Less than 30 minutes	1		
		30 minutes -1 hour	2		
		More than 1 hour	3		
		Don't know	88		
		No Response	99		
Q525	Were any instruments or manipulations used to help the delivery of the placenta?	Yes	1		
		No	2		
		Don't know	88		
		No Response	99		
Q526	Did you have any genital trauma? (perineal tearing/lacerations)	Yes	1		
		No	2		
		No Response	99		
Q527	Did you use any sitz bath drugs or warm salt water at home?	Yes	1		
		No	2		
		No Response	99		
Q528	How was your bleeding during the labor?	Wet my clothes	1		
		Wet the bed	2		
		Wet the floor	3		
		Don't know	88		
		No Response	99		

S.No	Questions and filters	Coding categories	Skip to	Code
Q529	Did you receive any blood transfusion?	Yes 1 No 2 Don't know 88 No Response 99	→ Q531	
Q530	How many bags of blood were you transfused?	Number of bags [___/___] Don't know No Response		
Q531	Did you have any of the following problems after the completion of the labor? **Readout lists!** **Multiple answers possible!**	Excessive vaginal bleeding 1 Foul smelling vaginal discharge 2 Urine leakage wetting the underwear 3 Urine leakage through the vagina 4 Febrile illness 5 Wound infection 6 Don't know 88 No Response 99		

Section VI: Physical Measurements

Finally, I would like to measure your height and weight!				
S.No	**Questions and filters**	**Coding categories**	**Skip to**	**Code**
Q601	What is the height of the respondent? **Measure and record!**	Height in Centimeters [_____] No Response		
Q602	What is the weight of the respondent? **Weigh and record!**	Weight in Kilograms [_____] No Response		
Q603	How many minutes' walk is it from the respondent's residence to the hospital? **Estimate for yourself if need be!**	Less than 15 1 15 – 30 2 30 – 60 3 more than 60 4 Don't know 88 No Response 99		

005 INTERVIEWER: Code [___/___] Name _____

006 DATE OF INTERVIEW: [___/___/___]

CHECKED BY SUPERVISOR:
Name _____ Signature _____ Date [___/___/___]

ANNEX 2: SNRS MAP