Factors Associated with Birth Spacing and Contraceptive Use in Leogane, Haiti

by

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Thesis submitted in partial fulfillment of
the requirements for the degree of
Master of Science in the Department of
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<u>ABSTRACT</u>

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Abstract

Spacing the inter-pregnancy interval to more than two years reduces maternal and neonatal morbidity and mortality. Modern contraceptive use can reduce maternal morbidity and mortality by contributing to birth spacing and reducing the total fertility rate. This study is designed to understand the factors associated with appropriate birth spacing and the barriers to modern contraceptive use in Leogane, Haiti. A cross-sectional survey of 552 reproductive age women in Leogane proper was performed from June to July of 2011. Univariate, multivariate, and logisitic regressions were used to analyze the data. The results demonstrate the importance of education, employment status, contraceptive use and stable relationships in influencing appropriate birth spacing. Women who spaced their births tended to have fewer complications compared to women who did not; however, this difference was not statistically significant. Barriers to contraceptive use were cultural factors such as religion, and low socioeconomic status. However, contraceptive use was positively influenced by education and partner acceptance of contraceptives. These findings indicate that family planning programs focused on educating women and their partners about the benefits of contraception and birth spacing would be successful in Leogane, Haiti.

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1. Introduction and Background

Pregnancy should be a beautiful time in a woman's life; however, in a developing country, it is the most perilous. Maternal mortality is still the leading cause of death for women in developing countries (UNIFEM, 2008). Though the maternal mortality rate (MMR) has decreased worldwide since the 1980's to as low as 4-5/100,000 in Europe and North America, this decrease has been disproportionate. In regions such as Africa and Southern Asia, the maternal mortality rate remains high, with one of highest in the Central African Republic (1570 per 100,000 live births) (Hogan et al., 2010). Postpartum hemorrhage, eclampsia (a consequence of hypertension in pregnancy), and sepsis are responsible for the majority of maternal deaths globally. The reduction in maternal mortality in the developed countries suggests that many of these deaths are preventable.

Family planning and birth spacing are recognized methods for reducing maternal and neonatal mortality. A birth-to-pregnancy interval of 18 to 23 months is associated with the best maternal and neonatal outcome (WHO, 2006). Short birth spacing intervals are associated with an increased risk of neonatal, infant, and under-5 child mortality, neonatal morbidity, infant/child malnutrition, low birth weight, and preterm birth (USAID, 2010). The countries with the highest maternal and neonatal morbidity and mortality have the lowest contraceptive use. Increasing the use of family

planning in developing countries could prevent 188 million unintended pregnancies, 1.2 million neonatal deaths, and 230,000 maternal deaths (Singh, 2009).

Haiti is the only country in the western hemisphere with a maternal mortality rate rivaling some countries in Sub-Saharan Africa, with a maternal mortality rate of 582/100,000 live births in 2008 (Hogan et al., 2010). Lack of access to care, a high rate of home birth (60%), and low rate of contraceptive use (25%) are primary culprits for this public health problem. Since 1983, family planning services have been available at hospitals, health centers, and health posts in rural and urban regions. In 1987, Private Sector Family Planning Project (PSFPP) (funded by the United States Agency for International Development (USAID)) was launched to supplement the public sector effort (Maynard-Tucker, 1996). In spite of investments and initiatives by USAID and the Haitian government, there has not been a significant increase in contraceptive use. Only 25% of married women use modern contraception, ranging from 13% in the Southeast region to a high of 30% in the Artibonite region of Haiti. There is a 39% unmet need, defined as the percent of married women between the ages of 15-49 who do not desire pregnancy and are not using contraceptives (WHO, 2012). Cultural factors, such as multiple congruent partnerships, women's desire for children as a means for economic stability, religious factors, as well as a low education level contribute to the high fertility rates, especially in rural regions of Haiti (Maynard-Tucker, 1996; WHO, 2012).

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Limiting fertility and increasing birth spacing has resulted in a decrease in the maternal and neonatal morbidity and mortality in developed countries. Reproductive services now help individuals achieve their desired number of children and proper spacing of pregnancies (Tuladhar et al., 2008). Birth spacing of less than six months is associated with 150% increased risk of maternal mortality, 650% increased risk of elective termination, and 230% greater risk of spontaneous abortion (USAID, 2008). In 2006, The World Health Organization (WHO) revised its recommendations based on evidence from six key studies and a review of those papers by an expert panel that included the authors, to a desired interval of 24 months before attempting another pregnancy and a six- month interval to pregnancy after a pregnancy that ended in an abortion or miscarriage (WHO, 2006).

Hence, increased birth spacing is an important component of improving maternal and child outcomes. This study sought a better understanding of the relationships between birth spacing, contraceptive use, maternal health and neonatal mortality in Leogane, Haiti. Effective interventions to implement the birth spacing recommendations are needed. Therefore, this study was designed to determine opportunities to develop culturally sensitive programs to increase contraceptive use and increase birth spacing.

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1.1 Literature Review

1.1.1 Maternal Morbidity and Mortality and Birth Spacing

Maternal mortality is defined as the death of a woman during pregnancy, childbirth, or within six weeks after the delivery, while maternal morbidity is defined as a condition that adversely affects a woman's health during childbirth beyond what would be expected in a normal delivery (Danel et al., 2003). The most common causes of maternal mortality globally, not related to HIV/AIDS, are hemorrhage, pregnancy-induced hypertension, infection, obstructed labor, and complications from termination of pregnancy (Singh et al., 2009). Available evidence from six key studies performed from 2000 to 2005 and funded by USAID demonstrated the benefit of increased birth spacing on maternal and child morbidity and mortality. These studies served as the basis to change the recommendations for birth spacing by the WHO. The outcomes reviewed were maternal death, pre-eclampsia, eclampsia, gestational diabetes, third trimester bleeding, premature rupture of membranes, preterm delivery, post-partum hemorrhage, puerperal endometritis, and maternal anemia; and for newborns, small for gestational age, low birth weight, neonatal death, and under-5 child mortality.

In a retrospective cross-sectional study by Conde-Agudelo and Belizan (2000) of data from the Perinatal Information System database of the Latin American Centre for Perinatology and Human Development in Uruguay from 1985 to 1997, birth spacing and pregnancy outcomes were reviewed. The database used was established in 1983 and has since recorded over a half million pregnancies of women from Uruguay, Argentina, Peru, Colombia, Honduras, Paraguay, El Salvador, Chile, Bolivia, Costa Rica, Panama, Dominican Republic, Nicaragua, Brazil, Ecuador, Mexico, Bahamas, and Venezuela. Birth spacing was defined as inter-pregnancy categories of 6-month intervals (i.e., 0-5, 6-11, 12- 17, 18-23, 24-59, >60). Comparisons were made with those conceiving at 18 to 23 months after a previous birth with those conceiving in a very short interval (<6 months) and long (>59 months). Women with inter-pregnancy intervals of 5 months or less had a 250% increased odds of maternal death, a 73% increased odds of third trimester bleeding, a 72% increased odds of premature rupture of membranes, a 33% increased odds of puerperal endometritis, and a 30% increased odds of anemia compared to women with an inter-pregnancy interval of 18 to 23 months. Women with inter-pregnancy intervals longer than 59 months had significantly increased odds of pre-eclampsia (83%) and eclampsia (80%) compared to women with an inter-pregnancy interval of 18-23 months (Conde-Agudelo & Belizan, 2000). Razzaque and colleagues (2005) also confirmed that women with very short birth intervals, less than six months,

were more likely to experience complications such as bleeding, premature rupture of membranes, and high blood pressure (Razzaque et al., 2005). Additionally, Conde-Agudelo and colleagues' systematic review and meta-analysis again, confirmed the association between very short pregnancy intervals with increased odds of anemia and postpartum endometritis, and the association of a pregnancy interval of greater than five years with pre-eclampsia and eclampsia (Conde-Agudelo, 2007).

In the US, the relationship between birth interval and birth outcomes such as low birth weight, preterm birth, and small for gestational age has been addressed in three studies of cross-sectional and retrospective cohort designs, conducted in two states, Utah and Michigan. These studies demonstrated that the risk of adverse birth outcomes was lowest for an inter-pregnancy interval of 18-23 months (Zhu, 2005).

This finding was confirmed in a meta-analysis conducted by Conde-Agudelo and colleagues (2006) on birth spacing and perinatal outcomes; inter-pregnancy intervals shorter than six months were associated with increased adjusted odds of preterm birth (40%), low birth weight (61%), and small for gestational age (26%). Pregnancy intervals of 6-17 months and intervals longer than 59 months significantly increased the risk of these adverse outcomes (Conde-Agudelo et al., 2006).

1.1.2 Birth Spacing and Child Morbidity and Mortality

Stronger evidence links short birth spacing to increased child morbidity and mortality (Rosmans, 1996; Zhu & Le, 2003; Conde-Aguedo, 2007). An interval of less than six months between pregnancies is associated with the highest risks of adverse outcomes. Under-5 child mortality, low birth weight and infant or child malnutrition are significantly increased with birth-to-pregnancy intervals of less than six months, while an interval of at least two years, but no more than five years, between pregnancies has been linked to improved neonatal morbidity and mortality and associated with the healthiest pregnancies (Conde-Aguedo, 2007).

Breastfeeding, a traditional form of contraception, and a resultant increase in birth spacing were the first to be correlated with reductions in child mortality (Rosmans, 1996). This was subsequently confirmed by a retrospective cohort study using the Michigan Maternal linked Birth Database (Zhu & Le, 2003). Zhu demonstrated an association between short birth intervals and low birth weight, and suggested that increasing birth spacing should be a strategy to address low birth weight deliveries. Further evidence revealed that a child born between three to five years after a sibling is 2.5 times more likely to survive than the child born after a shorter interval (USAID, 2006).

Maternal depletion syndrome and sibling competition were thought to contribute to the increased risks associated with short birth spacing. Short birth spacing could have resulted in maternal depletion, the overall change in maternal nutritional status over one reproductive cycle, by affecting the depletion and repletion phases in relation to initial nutritional status (Winkvist, 1992). Anderson and colleagues noted that in a family with a maternal death in rural Haiti, there is a 55% increased odds of a death of a child under 12 compared to a family that experiences a non-maternal death (Anderson et al., 2007). Sibling rivalry for resources as an indirect mechanism of short birth intervals was suggested as influencing child mortality, i.e., the death of the first-born child removes the competition for scarce resources and results in a lower risk of mortality for the following child than if the initial sibling was still alive (Witworth, 2002). Investigators in Matlab, Bangladesh, also found, controlling for other etiologies of infant and child mortality, that shorter intervals were associated with higher mortality, with a larger effect if the preceding pregnancy resulted in a live birth (DaVanzo, 2008). These studies suggest the viability of the sibling competition theory.

1.1.3 Contraception as a Tool to Increase Birth Spacing

Family planning programs have reduced the maternal mortality rate by reducing the total fertility rate, terminations, and unwanted pregnancies. The Guttmacher Institute estimated drastic reductions in unintended pregnancies and maternal deaths if

family planning utilization was increased in developing countries (Singh, 2009). Family

planning programs, many funded by USAID, have been established throughout the

developing countries with a primary mission to ensure healthier and safer births (Family

Health International (FHI), 2007). However, family planning programs perceived by

low-income countries as limiting fertility had low acceptance rates. Conversely,

programs focusing on birth spacing were deemed more acceptable (Health

Communication Partnership Impact (HCP) 2007; USAID, 2008). Childbearing is one of

the main expectations of recently married couples. Culture often dictates that young

couples reproduce early in the union. Appropriate birth spacing is a concept that has

been in practice in different cultures with varying norms sanctioned by community or

religious leaders. In Uganda, the recommended birth-to-birth interval is two years.

Similarly in Jordan, the recommended birth-to-pregnancy interval is two years (HCP,

2007). Therefore, programs established with emphasis on timing of pregnancies to

improve mother and child health gained community and cultural support.

      Family planning programs provide one or multiple modern contraceptive

options depending on availability of skilled providers. One of the least expensive and

most acceptable birth spacing methods has been breastfeeding. Breastfeeding was one of

the earliest traditional methods linked to increased birth spacing, with benefits not only

for contraception but also for delivery of passive immunity to the newborn (Saadeh &

Benbouzid, 1990). Modern contraceptive use (i.e., condoms, injectable, implantable, oral contraceptives, etc.) has been estimated to have averted 250,000 maternal deaths globally in 2008 by reducing unwanted pregnancies (Ahmed et al., 2012). Cleland and colleagues (2012) modeled the benefit of increasing contraceptive use globally and predicted a reduction in maternal mortality rate of 4.8/100,000 live births for each 1% increase in contraceptive use (Cleland et al., 2012).

1.1.4 Contraception and Barriers to Contraceptive Use

Despite the plethora of contraceptive benefits to maternal and neonatal/child health, contraceptive use remains low in many low-income countries. The mission of family planning programs is to help women achieve healthier pregnancies and safer births; however, the success of the programs is dependent on the utilization of the contraceptives (FHI, 2007; Yeakey, 2009). The utilization of family planning programs is conditional upon availability, access, and cultural acceptability (FHI, 2007). Condoms or barrier contraception have been advocated for pregnancy prevention and are also an essential method of HIV prevention, especially important in endemic HIV areas like Sub-Saharan Africa, where the disease prevalence is 26.4% (Adair, 2009). However, global use of barrier contraception was only 6% in 2008 (Family Planning Worldwide (FPW), 2008). Long-acting, reversible methods, such as implants and intrauterine devices, would fulfill the need for healthier timing and increase birth spacing (FHI,

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2007). A study in Nigeria demonstrated acceptability and satisfaction by women who

had used such a method (Haggai, 2003). However, access to long-acting contraceptives

in developing countries has been limited mostly to urban centers and clinics with skilled

staff (FHI, 2007). Global use of long-acting contraceptives was 18% in 2008 (FPW, 2008).

Sterilization, a permanent method of contraception reserved for women who have

completed their childbearing, has been performed more frequently, with a global rate of

21% in 2008 (FPW, 2008). Sterilization and vasectomy are safe options, but they are

dependent on availability of skilled providers and adequate facilities (FHI, 2007).

Access and availability are only a few of the barriers to family planning

programs. Studies from African countries, Bangladesh, Latin America, and Asian

countries revealed a multitude of barriers. In a study conducted in the eastern

Democratic Republic of Congo, barriers to the adoption of family planning among

women included lack of knowledge, fear of side effects, religious considerations, and

partner opposition (Mathe, 2011). Samandari and colleagues (2011) looked at the

differences between users and non-users in Cambodia and found that health concerns,

fear of side effects, husband support, access to health providers, and self-proven efficacy

contributed to initiation and continuation of modern contraception (Samandari et al.,

2011). In rural Peru, a survey of 54 couples found barriers to include lack of cultural

understanding by clinic staff, poorly explained side effects, and lack of knowledge of

human physiology (Tucker, 1996). In India, Jabeen and colleagues similarly identified

cultural factors, desire for a large family, pressure from partners, religious concerns, and

fear of side effects as barriers to acceptance of modern contraception (Jabeen et al., 2011).

In a review of the literature on barriers to fertility regulation in developing countries,

Campbell and colleagues (2006) found that challenges such as distance to travel,

financial component, women's roles in culture and their ability to make decisions,

medical barriers, side effects, fear and misinformation were significant (Campbell et al.,

2006).

1.1.5 Contraception and Birth Spacing in Haiti

Pre-eclampsia, hemorrhage, and sepsis are responsible for the majority of

maternal morbidity and mortality in Haiti, as in other parts of the developing world.

Pre-eclampsia and eclampsia account for 17% of maternal deaths in Haiti, even for

patients who present to a hospital setting, due to lack of appropriate critical care services

such as dialysis and ventilator support (Small et al., 2005). A few qualitative and mixed

methodology studies have looked at mistimed pregnancy and unplanned pregnancy in

Haiti.   Lathrop and colleagues reported that 55% of the women in a focus group who

had delivered at Justinian University Hospital in Cap Haitien, Haiti, had mistimed their

pregnancy and 49.8% had an unplanned pregnancy. The highest percent was in women

40-44 (70%). Lack of contraceptive use was a significant risk factor for the mistimed

pregnancy (Lathrop et al, 2011). Misinformation, fears of side effects, concerns about

exposing their children to contraceptives, and experienced side effects were identified as

barriers to contraceptive use (Lathrop, 2011). Education, desired family size, and the role

of the partner were associated with contraceptive use by Elizabeth Mason (2005).   These

limited studies have identified a gap in the understanding of the existing maternal

health structure as it related to birth spacing and contraceptive use, this study aims to

address this gap and provide a platform for further design and implementation of

family planning programs in Leogane, Haiti.

1.1.6 Study Goals

Haiti has one of lowest rates of contraceptive access for women and one of the

highest rates of maternal mortality in the western hemisphere (UNAIDS, 2008; WHO,

2012). Haiti continues to be ranked as one of the six countries with the highest maternal

mortality rate outside of Sub-Saharan Africa (UNAIDS, 2008). It is the poorest country in

the western hemisphere; over 70% of the population lives on less than two dollars per

day.

This study seeks to understand the current birth spacing intervals and traditional

methods used in Haiti and the barriers to modern contraceptive use in order to help

direct efforts to develop more culturally acceptable, effective, evidence-based

interventions to implement birth spacing recommendations. Decreasing maternal and

child mortality is a priority for the Haitian Ministry of Health and Family Health

Ministries (FHM), a non- governmental organization affiliated with Duke University in

Leogane, Haiti.

2. Methods

2.1 Study Method

Birth spacing is important to both maternal and neonatal reductions in morbidity

and mortality. This study conducted a survey to gain a better understanding of women's

health in Leogane, Haiti as it related to pregnancy spacing, pregnancy prevention

through the use of modern contraceptives and traditional methodologies, pregnancy

outcomes, and delivery complications. With a greater knowledge of the existing

maternal health system and cultural practices, a more culturally sensitive, evidence-

driven, and regionally accepted family planning program could be designed to increase

birth intervals as recommended by the WHO (WHO, 2006).

Research Question 1: What are the factors associated with a birth spacing of less than 2 years compared to a birth spacing of 2 years or greater in Leogane, Haiti?

Research Question 2: What is the effect of appropriate birth spacing on maternal morbidity and neonatal death in Leogane, Haiti?

A period of at least 24 months before attempting the next pregnancy is

recommended (WHO, 2006). There are four methods to determine the birth interval or

spacing: 1) Birth-to-birth interval of live births. 2) The inter-outcome intervals: the time

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between the outcome of a current pregnancy and a previous pregnancy outcome.

3) Birth-to-conception interval: the time between conception of current pregnancy and the live birth of the prior pregnancy. 4) Inter-pregnancy interval: the time spent in between pregnancies (WHO, 2006).

For this study, the only method available was the birth-to-birth interval; the women surveyed were unable to recall conception dates or inter-pregnancy intervals. The independent variables evaluated were education, socioeconomic status, employment, partner influence, modern contraceptive use, traditional contraceptive method use, and religious practice. The primary outcome was birth spacing.

For maternal and neonatal morbidity and mortality, information on pregnancies, deliveries and complications was elicited. The variables assessed were delivery location, delivery method, delivery attendant (skilled vs. unskilled), delivery complication, and neonatal birth outcome. We were unable to obtain medical records to validate the information of women surveyed.

Research Question 3: What are the Factors affecting contraceptive use in Leogane, Haiti?

Barriers to modern contraceptive use are not limited to the lack of access to contraceptive services. Cultural bias, financial costs, availability of contracpetive methods, distance for travel to clinic, medical barriers, fear of side effects, and misinformation were identified as barriers from a review of the literature performed by

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Campbell and colleagues (Campbell et al., 2006). Other potential confounding variables include education, knowledge, pregnancy parity, partner desire, availability of services, and cultural factors.

The aim was to understand which of these factors could interfere with health-seeking behavior and contraceptive utilization in Leogane, Haiti. Other determinants of birth spacing, such as traditional methods such as following the menstrual cycle, postpartum abstinence and other local cultural behaviors, were also evaluated.

2.2 Study Population

A cross-sectional study was conducted by performing face-to-face surveys of reproductive age women and a few men in Leogane, Haiti, over a seven-week period from June to July 2011. Leogane, considered to be rural, is located 34 Kilometers (21 miles) southwest of Port-au-Prince, the capital of Haiti, and was the epicenter of the 2010 earthquake, which destroyed 90% of the homes. The majority of the population (134,190 based on data from January 2012) was displaced and living in tent cities. Prior to arriving in Haiti, the intent was to randomly interview women who lived close to health centers providing contraceptive services and women who were further away. However, most women were still displaced and living in tents a year after the earthquake, therefore such randomization was not feasible. Consequently, tent cities and homes were randomly selected, and women who met the criteria for inclusion, primarily

reproductive age (18-49), were interviewed. Women were also randomly recruited to participate in the survey from beauty parlors, churches and grocery stores to account for all socioeconomic statuses. A small cohort of men were randomly selected in a similar fashion and surveyed to assess, both knowledge of contraception and, partner decision-making. The analysis of results will be completed at a later date. The analysis of the results of the termination of pregnancy data will also be completed at a later date.

2.3 Survey Development

The survey was designed based on the reproductive health and maternal health questionnaire used in the Demographic and Health Surveys established by USAID. See Appendix for survey questionnaire. The survey included pregnancy, contraception, abortion, and barriers to care questions. The survey was reviewed and pre-tested by Haitian expatriates. The final survey was approved by the Duke University IRB and the Family Health Ministries Haitian IRB and subsequently translated into Haitian Kreole. In Leogane, the survey was locally pre-tested and reviewed with a group of Haitian women leaders affiliated with Family Health Ministries. Two translators were chosen with the assistance of the Haiti-based members of Family Health Ministries. The questions were reviewed with both translators to ensure that both would ask the questions in a similar manner. The investigator and co-investigator were paired with one of the translators.   In planning the study, some of the survey questions intentionally

contained sensitive information. Though women were assured of confidentiality, it was

expected that some women might not answer freely. However, this was not the case.

Women provided what seemed to be very sincere and truthful details in their personal

accounts. Five women refused to participate in the surveys for other reasons; two

women were preparing for a funeral and the other three were busy working at the

marketplace. Each interview process took between 15 and 20 minutes. The participants

were thanked with a small token, a bar of soap.

2.4 Data Analysis

The data presented represents a convenience sample of 574 Haitian women

living within a two-mile radius of Leogane proper. Some of the women (22) were over

50; others did not complete the survey and were excluded from analysis. Only data from

surveys of women are presented. The surveys completed by men will be analyzed at a

later date. Data collected included demographic and socioeconomic variables (e.g., age,

years of education, marital status, religion, living situation), birth variables (e.g., number

of children, time interval between delivery of children, method of delivery, delivery

complications) and contraceptive use variables (i.e., frequency and duration of use of

contraceptive methods, partner opinion of contraceptive methods).

2.5 Statistical Methodology

Univariate analyses (mean, standard deviation, range, frequency) are reported for variables related to childbirth for all women surveyed (e.g., number of pregnancies, interval between pregnancies). To assess determinates of proper birth spacing, only women who had given birth to at least two children were selected for sub-analysis. For these women, the interval between their two most recent deliveries was calculated, and they were dichotomized into proper birth spacing (≥ 2 years between deliveries) and improper birth spacing (< 2 years between deliveries). Nonparametric bivariate analyses (Mann-Whitney U test, chi-square test of independence) were conducted to determine differences in demographic and contraceptive use between women who appropriately spaced their births and those who did not. Each moderately associated predictor ($p < .20$) was then entered into a multivariable logistic regression model. The covariate with the highest p value ($>.05$) was removed and the model was refit until all predictors were significant (or nearly significant, if they were determined to be of great research interest). Interaction terms between predictors were then examined using the same methodology.

Frequencies and percentages of maternal morbidity and neonatal mortality associated with childbirth were reported. The association between birth interval, route

of delivery and maternal morbidity and neonatal mortality at delivery was examined using bivariate analyses (*t*-tests, chi square tests of independence).

Univariate analyses were presented for contraceptive use and partner acceptance variables. Using the methodology described above, nonparametric bivariate analyses and logistic regressions were used to determine the relationship between demographics and partner acceptance and use of contraceptives.

The variables analyzed were inter-related. Many of the independent variables were confounders, influencing both exposure of contraceptive use and birth interval. The relationships were very complex and difficult to assess in a cross-sectional   study format. The factors known to influence birth intervals were controlled for. Data was entered into Excel 2007 (Microsoft Corporation) while in Haiti, cleaned upon return to the United States, and subsequently exported and converted to IBM SPSS v.20 for analysis. All statistical tests were performed at a 2-tailed level of significance of $p = .05$.

2.6 Study Limitations

Limitations of this cross-sectional study include non-probability sampling, recall bias, temporal bias, sample size, and survivor bias. The method employed was one of a non-probability convenience sample, we randomized the blocks to survey based on Google maps and then select random houses or tents to interview; however, in areas where there were multiple tents a randomization could not be performed. Also, due to

lack of electricity and safety concerns, all surveys were completed during the day

between the hours of 8 and 2 pm. The categorization of women as appropriate or

inappropriate birth spacers was dichotomized to "all appropriate" or "at least one

inappropriate" birth interval. Contraceptive use was also dichotomized to "ever" or

"never" for the purpose of the data analysis and could lead to temporal bias. Several

women were unable to recall details of previous births, particularly if their pregnancies

were numerous and early in their reproductive lives. To minimize the effect, we

analyzed the data from the last two birth intervals, reducing the sample size. Also, lack

of a partner as a variable was not assessed to etiology of a longer birth interval. Birth

complications were obtained from the women surveyed and were uncorroborated by

health records. In addition, the women surveyed had all survived their complications,

hence the survival bias.

Leogane is only 21 kilometers from Port-au-Prince; however, it is considered to

be a rural department of Haiti. Differences between rural and urban communities could

confound the data and limit the generalization of the study. Post-earthquake, there was

significant migration; therefore several of the women surveyed were from the urban

area of Port-au- Prince and may have mitigated this effect.

3. Results

3.1 Demographic Information

Women (n=552) ranged from 18 to 58 years old (m = 29, sd = 9). Twelve percent received no education and over one third (38%) had not entered secondary school. Seventy-four percent of the women were unemployed. On average, five people lived in each household (range = 1 to 20, sd = 3).

Ninety percent of women described religious practice. Most were Catholic (43%) or Protestant (30%). Of the women reporting religious practice, 71% attended church services more than twice a month. Only 2% identified themselves as vodouisants, however, 19% believed in Vodou and 20% reported attending at least one Vodou ceremony per year. Baptist, Jehovah's Witness, Seventh Day Adventist, Mormon, and Methodist composed another 16% of the respondents. Only 10% of the women surveyed reported that they did not subscribe to any religion.

Most women had never been married (43%) or were cohabitating with a partner (44%). Only 10% were currently married. On average, women had two children (range = 0 to 12, sd = 2) and wanted to have three children in total (range = 0 to 12, sd = 1). See Table 1 for details of participant demographics.

Table 1: Patient Demographics.

Characteristic n = 552 women	N (%) range, m(sd)
Age	18-58, 29(9)
Education	
≤ Primary school	212 (38%)
Secondary school or higher	340 (62%)
Employment status	
Paid employment	120 (22%)
Unpaid employment	20 (4%)
Unemployed	412 (74%)
Living situation	
House	348 (63%)
Tent	204 (37%)
Number of additional people in household	0-20, 5(3)
Religion	
Catholic	240 (44%)
Protestant	166 (30%)
*Other	89 (16%)
Not religious	57 (10%)
Marital status	
Married	53 (10%)
Single/Never married	235 (42%)
Cohabitating	242 (44%)
Other (widowed, divorced)	22 (4%)
Number of children	0-12, 2(2)
Number of children desired	0-12, 3(1)

*other category includes: Vodou, Seventh Day Adventist, Mormon, Jehovah's Witness, and Baptist

3.2 Birth Spacing

Of the 552 women surveyed, 309 (56%) had either never been pregnant or had

delivered only one child. Accordingly, analyses of birth spacing were restricted to the

remaining 244 women. Of those women who had at least two children, the mean

number of pregnancies was three (range = 2 to 12, sd = 1) and the mean interval between

deliveries was 4.2 years (sd = 2.8 years). Sixty-five women (27%) had spaced at least one

of their births inappropriately in their lifetime (interval between deliveries < 2 years) and

178 (73%) spaced all of their births appropriately (interval between all deliveries ≥ 2

years). In order to minimize recall bias and to ensure that having more children did not

influence the chance for a woman to inappropriately space at least one birth, only the

interval of the two most recent deliveries was considered for analytic purposes. Two

hundred nine women (86% of women with two or more births) appropriately spaced

their most recent two births and 35 (14%) did not.

Women who appropriately spaced their births and those who did not

were compared to determine the association between demographic variables and

appropriate birth intervals. The results are presented in Table 2. In summary, age,

number of people living in the household, employment status, marital status, type of

housing, and use of modern contraception were related to appropriate birth intervals.

Religion, education, number of children desired, and use of traditional contraceptives

were not related to appropriate intervals.

Table 2: Differences between appropriate and inappropriate birth spacers in contraception and demographic variables.

Characteristic	Mann-Whitney U test p value
Age	.195
Number of additional people in household	.079
	Chi-square, p
Type of housing	2.43, .119
Employment status	4.33, .037
Marital status	5.36, .069
Use of modern contraception	3.04, .081

Multivariable logistic regression was used to determine which associated variables would predict appropriate birth interval. Living with more people in the household was associated with improper birth spacing, such that each additional person predicted a decrease of .13 in the odds of proper birth spacing. Being employed was associated with 2.81 greater odds of proper birth spacing. Ever use of contraception was nearly statistically significant (p = .06), predicting 2.05 greater odds of proper birth spacing. The final model was significant (X^2 = 13.30 (3 df), p = .004) (see Table 3).

Table 3: Logistic regression predicting appropriate birth spacing.

	b(se)	Wald(1 df), p	OR (95% CI)
Additional people in household	-.15(.06)	5.34, .021	.862(.761, .978)
Using contraception	.72(.38)	3.53, .060	2.053(.969, 4.349)
Being employed	1.03(.48)	4.58, .032	2.805(1.091, 7.209)

3.3 Maternal Morbidity and Neonatal Mortality

In evaluating maternal morbidity and neonatal mortality, 387 women (70%) had given birth to at least one child. In total, the women had 929 deliveries. Of those 929 deliveries, 13% of women reported experiencing complications during delivery or post-partum. The types of complications women reported included fever (16, 13%), eclampsia (20, 16%), and hemorrhage (13, 11%). Six percent (57) of babies were delivered via cesarean section. Skilled attendants (doctor, nurse) were present at nearly half of the deliveries (426, 46%); however, for 496 deliveries (54%), the woman was alone or with unskilled midwives or family members. Similarly, 44% (407) of births occurred in hospitals or clinics, while 56% (515) occurred at home or in an outdoor location.

Of the 244 women with at least two pregnancies, deliveries were compared to examine the impact of birth spacing on maternal morbidity and neonatal mortality at birth. The results are presented in Table 4. In summary, although proper birth spacing inferred protection against complications, delivery by cesarean section, and neonatal death, none of the results were statistically significant.

Table 4: Maternal morbidity.

Complication	Spaced birth appropriately	Did not space birth appropriately	AOR* (95% CI)
Experiencing Complications	44, 10%	9, 12%	.85(.39, 1.83)
Caesarean Section	21, 5%	5, 6%	.74(.27, 2.05)
Death at delivery	5, 1%	3, 4%	.28(.06, 1.24)

*Odds ratio adjusted for maternal age at delivery

Lastly, women who spaced all of their births appropriately were compared with those who spaced at least one of their births inappropriately by use of proper facilities (hospitals, clinics) for giving birth and using skilled delivery professionals (doctors, nurses). Women who spaced all of their births appropriately were more likely to utilize a hospital or clinic for delivery (47% of deliveries for appropriate spacers vs. 32% for inappropriate spacers) Odds ratio = 1.9, 95% CI = (1.37, 2.58). Consequently, they were more likely to be attended by a skilled professional (74% for appropriate spacers vs. 25% for inappropriate spacers) Odds ratio = 2.0, 95% CI = (1.46, 2.73).

3.4 Factors Influencing Contraceptive Use

All 552 of women surveyed were used for analysis. Three hundred twenty-seven (44%) women indicated that they had "ever" used modern contraception, and 62 (11%) used traditional methods. The most commonly utilized method of family planning was injection (177, 57%) followed by condoms (104, 32%). The most commonly used

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traditional method was following the menstrual cycle (17, 27%). See Table 5 for further

detail of contraception use.

Table 5: Modern and Traditional Contraceptive Use.

Characteristic All women, n=552	n (%) range, m(sd)
Used some form of family planning Yes No	 318(58%) 228(41%)
Used modern contraception	327(59%)
Form of modern contraception used Pill Injection Condoms	 36(11%) 187(57%) 104(32%)
Experienced side effects	145(44%)
Side effects experienced Felt bad Headache Bleeding problems Other	 6(4%) 46(32%) 73(50%) 20(14%)
Used traditional methods	62(11%)
Traditional method used Persil leaf tea Cold water Follow menstrual cycle Salt water Other	 14(23%) 3(5%) 17(27%) 9(15%) 19(31%)
Had a male partner n = 345	
Number of children desired by partner	0-20, 2(2)
Partner approves of contraception Yes No Don't know Did not answer	 263(48%) 82(15%) 184(33%) 23(4%)
Contraception decision maker Man Woman Both Don't use contraception/Did not answer	 142(26%) 40(7%) 75(14%) 295(53%)

Women who had no deliveries and those who had at least one delivery were stratified into two groups. Women who used modern contraceptives and those who did not were compared to determine the association between demographic variables and contraceptive use. The results are presented in Table 6.

Table 6: Differences between women who used modern contraception and those who did not looking at demographic variables and partner opinion.

Characteristic	Mann-Whitney U test p value	
	0 Children	≥ 1 child
Age	ns*	.13
Number of pregnancies		.02
	Chi-square, p	
Employment status	ns	2.91, .09
Religion	11.3 (3 df), .01	5.8, .12
Education	5.3, .02	2.9, .09
Marital status	6.1 (2 df), .05	3.5, .17
Experienced complications during pregnancy		3.95, .05

*ns = not significant, $p > .20$

Multivariable logistic regressions were used to determine which associated variables would be able to predict modern contraceptive use in women without any children and women with children. In women without prior births, having a religious preference was associated with a decrease in the odds of the woman's use of contraception compared to not having a religious preference. Being a Protestant most

strongly predicted no contraception use (OR = .199). A high school level education or

higher was associated with 2.81 greater odds of contraceptive use. The final model was

significant (X^2 = 16.35 (4 df), p = .003) (see Table 7).

In women with at least one delivery, age negatively predicted contraceptive use,

such that an increase of one year predicted .05 lower odds of contraceptive use. Number

of pregnancies was associated with 1.28 greater odds of contraceptive use, and a high

school or higher education showed a trend (p = .08) toward 1.5 greater odds of

contraceptive use. The final model was significant (X^2 = 15.32 (3 df), p = .002).

Table 7: Logistic regression predicting modern contraceptive use.

Zero Children			
	b(se)	Wald(1 df), p	OR (95% CI)
No religion (Reference)			
Catholic	-.58(.61)	.89, .35	.562(.170, 1.857)
Protestant	-1.6(.65)	6.11, .01	.199(.055, .716)
Other	-1.3(.69)	3.73, .053	.266(.070, 1.01)
Secondary school or higher education	1.03(.49)	4.43, .04	2.812(1.074, 7.359)
One or more children			
Age	-.05(.01)	9.85, .002	.956(.930,.983)
Number of pregnancies	.25(.09)	7.84, .005	1.281(1.077, 1.522)
Secondary school or higher education	.41(.23)	3.12, .08	1.504(.956, 2.367)

Three hundred forty five women of the women surveyed indicated that they had

a male partner. Of them, the majority (263) thought their partner approved of

contraceptive use. When asked whether they or their male partner was responsible for reproductive decision-making, 142 women indicated the male was responsible (see Table 5). For women without prior pregnancies, partner opinion influenced use of contraception, such that women who perceived that their partner had a positive opinion of contraceptive use had 3.05 greater odds of using contraception (95% CI = (1.10, 9.20). For women with pregnancies, partner opinion did not have any effect. Neither group demonstrated differences in contraceptive use based on the number of children they thought their partner wanted. Perception of contraception decision-making ability did not have any effect on contraceptive use.

4. Discussion

4.1 Interpretation of Results

In examining the factors associated with appropriate birth intervals, sixty-five women (27%) had spaced at least one of their births inappropriately in their lifetime and 178 (73%) spaced all of their births appropriately. However, to minimize errors from women's inability to recall details of earlier pregnancies, we analyzed only the last two pregnancy intervals. Two hundred nine women (86% of women with two or more births) appropriately spaced their most recent two births and 35 (14%) did not. When asked, "How long should you wait before having your next child?", unanimously all women replied greater than two years. Interestingly, the reported reason for the wait was not to improve maternal or child health, but rather to be able to provide for the child and the family.

Of the variables examined, age, number of people in the household, marital status, employment status, type of housing, and use of modern contraceptives were related to birth spacing. Being employed and use of contraceptives were more predictive of appropriate birth spacing. Though only 22% of our women were employed, being employed had 2.81 greater odds of being a proper birth spacer than being unemployed. Ever use of contraception was nearly statistically significant, predicting 2.05 greater odds of appropriate birth spacing than women who were never users.

The survey was performed a year and a half after the 2010 earthquake. Several of the women were still displaced and living in tents. Therefore, the number of people living in a household was used as a surrogate measure of socioeconomic status. The data indicated that the number of individuals in a house/tent was negatively associated with proper birth spacing, such that each additional person predicted a decrease of .13 in the odds of proper birth spacing.

Previous data suggested that cultural norms influence birth intervals in Jordan and Uganda, and the type of relationship influenced women's fertility rate in Haiti (USAID, 2008; Maynard-Tucker, 1996). In this sample of women, poverty was a stronger influence than cultural dynamic or type of relationship between couples as to total fertility or birth interval. This is consistent with Lathrop and colleagues (2011), who found that economic hardship was a motivator and a deterrent to pregnancy and family planning (Lathrop et al., 2011). This study suggests that for Leogane, Haiti, socioeconomic factors play a more prominent role. This emphasizes that future interventions must take into consideration these social determinants of health.

In comparing complication rates between women who spaced their births appropriately and women who had not, in 13% of the 929 deliveries, women reported experiencing complications in the antenatal or postnatal period. The types of complications women reported included fever (13%), eclampsia (16%), and hemorrhage

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(11%). While, proper birth spacing suggested protection against complications, no

significant differences were noted. Data from Leogane was consistent with national data

from the 2007 DHS survey in deliveries attended by skilled providers and cesarean

deliveries. However, deliveries at health facilities were higher in Leogane proper, almost

double (Table 8). This could be a temporal event due to the timing of the survey. After

the earthquake, Leogane was served by multiple NGOs, therefore access to care with the

presence of two hospitals, a public hospital and a temporary Medicin Sans Frontiers,

may have influenced the results.

Table 8: Comparison of National DHS data with regional Leogane Data.

	Leogane, Haiti		*DHS survey Data for Haiti	
Skilled Birth Attendant	46%		Urban 46.8%	Rural 15.4%
Place of Delivery	Health Facility 44%	Home 56%	Health Facility 24.7%	Home 74.8%
Cesarean section	6%		Urban 6.2%	Rural 1.4%

*Source: ORC Macro 2007, MEASURE DHS STATcompiler. WHO, Haiti Country Profile.

Women who spaced their births appropriately did in fact experience fewer

complications than women who had not. However the results were not statistically

significant, although, they did show a positive trend. The women interviewed were ones

who survived their complications. The sample size, in comparison with the studies in

the literature, was small and not powered to detect significant differences. Nevertheless,

we did confirm that the complications or maternal morbidity experienced by the women

of Leogane, Haiti is consistent with global data of hemorrhage, eclampsia, and sepsis.

Of the 552 women surveyed, only 44% had ever used modern contraceptives,

and 11% used traditional methods (Table 9).

Table 9: Modern Contraceptive and Traditional Contraceptive use compared to National and World Data.

	*Haiti 2008	Leogane Data N=242 44% of 552	*World
Other Traditional Methods	0.6%	11.0%	-
Condom	5.3%	32.0%	6.0%
Female Sterilization	2.1%	-	21.0%
Injection	11.0%	57.0%	4.0%
IUD	-	-	14.0%
Male Sterilization	-	-	4.0%
Periodic Abstinence	2.4%		3.0%
Pill	3.3%	11.0%	8.0%
Withdrawal	4.2%		4.0%
Other Modern Methods	3.0%		1.0%

*Source: PRB Family Planning Worldwide 2008

In this sample of women, side effects, primarily bleeding problems, were the

main reasons for discontinuation of modern contraceptives. In young adult women, fear

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of side effects, e.g., infertility was the main reason for not initiating modern contraceptives. This finding is consistent with studies from other low-income countries. Infertility was one of the exaggerated myths of contraception in Cambodia (Samandari & O'Connell, 2011; Lathrop et al., 2011). Haitian women's ability to reproduce is paramount. It was believed at one point that sterile women were under a curse by black magic (Maynard-Tucker, 1996). Hence, young women were less likely to use contraceptives. Family planning programs, through education, can de-mystify contraception.

In women without children, a high school level education or higher was associated with 2.81 greater odds of contraceptive use. In women with at least one child, having a high school or higher education showed a trend toward 1.5 greater odds of contraceptive use, and having more pregnancies was associated with 1.28 greater odds of contraceptive use. Encouraging education as a measure to lower maternal mortality by reducing high-risk pregnancies has been suggested previously (Singh et al., 2009). Though this was primarily a quantitative study, when asked, several of the young adult women expressed the desire to complete their education as a reason to delay childbearing, or wished they had delayed childbearing until their education was complete. The importance of education is an idea that has permeated the community and presents an opportunity that should be capitalized on in the future.

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Nulliparous women with a male partner were more likely to use modern contraceptives if they thought their partner approved of contraceptive use, such that women who perceived that their partner had a positive opinion of contraceptive use had 3.05 greater odds of using contraception. Conversely, for multiparous women, partner opinion did not have any effect. Most women in both groups perceived that men were responsible for reproductive decision making. Further research into partner effect on contraceptive utilization would be very informative in establishing family planning programs.

Of the women surveyed, 11% used traditional methods to increase the birth interval or prevent pregnancy. Local practices such as post-coitus Persil leaf tea, ice water, or salt water were thought to prevent pregnancy. Some women also believed that cold beer after coitus prevented pregnancy. Though many of the women surveyed had become pregnant with these traditional methods, practice of these methods continues.

4.2 Recommendations for Further Studies

Young adult Haitian women surveyed believed that modern contraceptives had multiple, severe side effects. Most women obtain their contraceptives from pharmacies and had not attended clinics or had a consultation with a skilled provider. Most young adults indicated that fear of infertility prevented them from initiating contraceptives. Young women were told by peers, family, or male partners that they should have a baby

prior to starting birth control; otherwise, they would become infertile. Given the high value placed on reproductive capability in the culture and the myths related to contraceptive use, programs increasing knowledge and de-mystifying contraceptives geared towards young adults should be explored.

In this study, women who were educated were more likely to space their births and use contraceptives. Finding a way to increase targeted education on contraceptives outside the classroom, such as churches, beauty parlors, etc., as well as peer education, may be the best method to increase awareness, as 40% of women surveyed did not attend school or had not entered secondary school.

In women without a prior pregnancy and with a partner, the partner's positive opinion increased the odds of contraceptive use. This could be explored further, by educating couples in stable unions on the importance of birth spacing for maternal and neonatal health, and on methods for delaying pregnancy, such as modern contraception. The couple then could be followed at quarterly intervals in a prospective observational design for outcomes such as contraceptive use, conception, completion of pregnancy, and morbidity and mortality.

5. Conclusion

Understanding the various types of relationships and reproductive expectations as well as the cultural norm is important to the development of family planning programs addressing barriers to implementation. Factors such as poverty, level of education, cultural dynamic, partner influence, and the myths associated with contraception have to be addressed. Haitians place a high value on fertility; a popular saying is "ti moun se riches" (children are wealth). A woman's ability to have children is extremely important in the Haitian culture (Maynard-Tucker, 1996). However, high fertility rates contribute to poverty and the sequelae of poverty such as poor health outcomes. Appropriate birth spacing and contraceptive use can, over time, reduce the fertility rate and improve health outcomes. Educated and employed women were more likely to reconcile cultural beliefs and space their pregnancies appropriately and use contraception, likely due to their economic independence and decreasing reliance on male partners for survival. While side effects such as bleeding complications from injectable progestin were significant contributors to cessation of contraceptive use and a deterrent to initiation of contraceptives. Programs that include long-acting contraceptives such as the copper IUD or hormonal IUD with less of a bleeding side effect profile would be more acceptable and effective. Most women obtained hormonal contraceptives from pharmacies or post-partum from an NGO. Once they experienced a

complication, they ceased to use the medication. Having a cadre of trained staff or appropriately educated peers easily accessible to address the concerns and questions that arise is essential to the success of any family planning program in Haiti. Women were unaware of the maternal and neonatal benefits for birth spacing. As in other parts of the world, a focus on the benefits of birth spacing compared with fertility limitations would be most beneficial. The results indicate that family planning programs directed at educating women and their partners on the benefits of contraception and birth spacing could be successful in Leogane, Haiti.

Appendix

Female Survey

1. Age
2. Year of Birth

3. Education Level

1   Partial primary
2   Primary
3   Secondary
4   Partial University
5   Completed University
6   Technical or Professional
        Training

4. What is your employment
status?
1   not employed
2   job with salary
3   unpaid work
4   other - specify

5. How many people live with
you?

6. Do you live in a house or have
you been displaced in a tent? (If
yes, answer 7-9. If no, skip to 10)

7. What is the floor of your house
made of?
1 cement
2 tiles
3 mud
4 other -specify

8. What is the roof of your house
made of:
1 iron sheets
2 cement
3 thatched
4 other- specify

9. Do you have a latrine at your
house?
        1 Yes   2 No

10. What is the source of your
drinking water?
    1   Tap
    2   Protected well
    3   Unprotected well
    4   stream/river
    5   uncapped spring
    6   other- specify

11. What is your religion?
Catholic
Protestant
Vodou
Other: (Please specify)
_____

12. Do you attend church?
[ ]Yes
[ ] No
If yes, answer

13. If yes, How often do you
attend church services? If no, skip
question.

[ ] Less than once a month
[ ] Once a month
[ ] Twice a month
[ ] More than twice a month

14. Do you believe in Vodou?
[ ]Yes
[ ]No

15. How often do you consult an
ougan/mambo?
[ ] more than once a month
[ ] once a month
[ ] once a year
[ ] less than once a year
[ ] never

16. Marital status
[ ] never married
[ ] married
[ ] Living as married cohabitation
(free union)
[ ] Widowed
[ ] Divorced

17.   How old were you when
        you got your first
        menstrual period?
            list age:

18. Are you currently pregnant?
[ ] Yes
[ ] No

19. Have you been pregnant
before?
[ ] Yes
[ ] No

20. Do you currently use
contraception (birth control pills,
injection, condoms))?
[ ] Yes
[ ] No
21. How many times have you
been pregnant (including live
births, abortions/miscarriages)?

22. How many children did you
give birth to?
List the number of children:

23. How many are alive
List number:

24. How many are dead?
List number:

25. How many were aborted? Or
miscarried?
List number:

Repeat questions 26-40 for each
pregnancy the patient has had for
birth spacing.

Pregnancy 1
26. How old were you when you
got pregnant for the first time?
List age:

27. When you got pregnant the first time, did you want to be pregnant?
[ ] Yes
[ ] No

28. If no, how much longer did you want to wait?
[ ] Less than 6 months
[ ] 6-12 months
[ ] 13 months-2 years
[ ] more than 2 years
[ ] I did not want to get pregnant again

29. How much did your baby weigh at birth?
List in grams:

30. Who helped you with the delivery?
[ ] No one
[ ] Family Member
[ ] Midwife
[ ] Nurse
[ ] Doctor

31. Where did you give birth?
Home, etc.
[ ] Home
[ ] Hospital
[ ] Clinic
[ ] Outside

32. If you delivered in the clinic or hospital, How long after did you stay?
[ ] less than 1 day
[ ] 1 day and 1 night
[ ] 2 days and 2 nights
[ ] more than 2 days and 2 nights

33. Did you deliver by cesarean? Or push?
[ ] Cesarean
[ ] Push

34. Did you have any complications after delivery?
[ ] Yes
[ ] No
If yes, answer #35; if no, skip to 36

35. What type of complication? (check all that apply)
[ ] The baby came too early or too small
[ ] Fever
[ ] Hemorrhage
[ ] Bad Blood (Mauvais sang)
[ ] Voduo curse
[ ] Seizure or Headache or Preeclampsia
[ ] Baby died
[ ] Baby did not fit; needed emergency cesarean

36. Did you breastfeed your baby?
[ ] Yes
[ ] No
If yes, answer #39-41; if no, skip to #42.

37. Are you breastfeeding now?
[ ] Yes
[ ] No

38. How long did you breastfeed?
[ ] <3 months
[ ] 3 months-6 months
[ ] 6-12 months
[ ] 12 months to 2 years
[ ] more than 2 years

39. How old was the baby when you started feeding him food or water?
[ ] <3 months
[ ] 3-6 months
[ ] 6-12 months
[ ] 12 months to 2 years
[ ] older than 2 years
Now skip to #43.

40. If you didn't breastfeed, why not?
[ ] Don't like
[ ] It hurts
[ ] No milk
[ ] Too sick
[ ] My partner does not want me to

Pregnancy #2

26. How old were you when you got pregnant the next time?
List age:

27. When you got pregnant this time, did you want to be pregnant?
[ ] Yes
[ ] No

28. If no, how much longer did you want to wait?
[ ] Less than 6 months
[ ] 6-12 months
[ ] 13months-2 years
[ ] more than 2 years
[ ] I did not want to get pregnant again

29. How much did your baby weigh at birth?
List in grams:

30. Who helped you with the delivery?
[ ] No one
[ ] Family Member
[ ] Midwife
[ ] Nurse
[ ] Doctor

31. Where did you give birth?
Home, etc.
[ ] Home
[ ] Hospital
[ ] Clinic
[ ] Outside

32. If you delivered in the clinic or hospital, How long after did you stay?
[ ] less than 1 day
[ ] 1 day and 1 night
[ ] 2 days and 2 nights
[ ] more than 2 days and 2 nights

33. Did you deliver by cesarean? Or push?
[ ] Cesarean
[ ] Push

42

34. Did you have any complications after delivery?
[ ] Yes
[ ] No
If yes, answer #35; if no, skip to 36

35. What type of complication?
[ ] The baby came too early or too small
[ ] Fever
[ ] Hemorrhage
[ ] Bad Blood (Mauvais sang)
[ ] Vodou curse
[ ] Seizure or Headache or Preeclampsia
[ ] Baby died
[ ] Baby did not fit; needed emergency cesarean

36. Did you breastfeed your baby?
[ ] Yes
[ ] No
If yes, answer #39-41; if no, skip to #42.

37. Are you breastfeeding now?
[ ] Yes
[ ] No

38. How long did you breastfeed?
[ ] <3 months
[ ] 3 months-6 months
[ ] 6-12 months
[ ] 12 months to 2 years
[ ] more than 2 years

39. How old was the baby when you started feeding him food or water?
[ ] <3 months
[ ] 3-6 months
[ ] 6-12 months
[ ] 12 months to 2 years
[ ] older than 2 years
Now skip to #43.

40. Why did not you not breastfeed?
[ ] Don't like
[ ] It hurts
[ ] No milk

[ ] Too sick
[ ] My partner does not want me to

Pregnancy #3
26. How old were you when you got pregnant the next time?
List age:

27. When you got pregnant with the first baby, did you want to get pregnant at that time?
[ ] Yes
[ ] No

28. How much longer did you want to wait?
[ ] Less than 6 months
[ ] 6-12 months
[ ] 13months-2 years
[ ] more than 2 years
[ ] I did not want to get pregnant again

29. How much did your baby weigh at birth?
List in grams:

30. Who helped you with the delivery?
[ ] No one
[ ] Family Member
[ ] Midwife
[ ] Nurse
[ ] Doctor

31. Where did you give birth? Home, etc.
[ ] Home
[ ] Hospital
[ ] Clinic
[ ] Outside

32. If you delivered in the clinic or hospital, How long after did you stay?
[ ] less than 1 day
[ ] 1 day and 1 night
[ ] 2 days and 2 nights
[ ] more than 2 days and 2 nights

33. Did you deliver by cesarean? Or push?

[ ] Cesarean
[ ] Push

34. Did you have any complications after delivery?
[ ] Yes
[ ] No
If yes, answer #35; if no, skip to 36

35. What type of complication?
[ ] The baby came too early or too small
[ ] Fever
[ ] Hemorrhage
[ ] Bad Blood (Mauvais sang)
[ ] Vodou curse
[ ] Seizure or Headache or Preeclampsia
[ ] Baby died
[ ] Baby did not fit; needed emergency cesarean

36. Did you breastfeed your baby?
[ ] Yes
[ ] No
If yes, answer #39-41; if no, skip to #42.

37. Are you breastfeeding now?
[ ] Yes
[ ] No

38. How long did you breastfeed?
[ ] <3 months
[ ] 3 months-6 months
[ ] 6-12 months
[ ] 12 months to 2 years
[ ] more than 2 years

39. How old was the baby when you started feeding him food or water?
[ ] <3 months
[ ] 3-6 months
[ ] 6-12 months
[ ] 12 months to 2 years
[ ] older than 2 years
Now skip to #43.

40. Why did not you not breastfeed?

[ ] Don't like
[ ] It hurts
[ ] No milk
[ ] Too sick
[ ] My partner does not want me to

Pregnancy #4

26. How old were you when you got pregnant for the next time?
List age:

27. When you got pregnant with the first baby, did you want to get pregnant at that time?
[ ] Yes
[ ] No

28. How much longer did you want to wait?
[ ] Less than 6 months
[ ] 6-12 months
[ ] 13months-2 years
[ ] more than 2 years
[ ] I did not want to get pregnant again

29. How much did your baby weigh at birth?
List in grams:

30. Who helped you with the delivery?
[ ] No one
[ ] Family Member
[ ] Midwife
[ ] Nurse
[ ] Doctor

31. Where did you give birth?
Home, etc.
[ ] Home
[ ] Hospital
[ ] Clinic
[ ] Outside

32. If you delivered in the clinic or hospital, How long after did you stay?
[ ] less than 1 day
[ ] 1 day and 1 night

[ ] 2 days and 2 nights
[ ] more than 2 days and 2 nights

33. Did you deliver by cesarean? Or push?
[ ] Cesarean
[ ] Push

34. Did you have any complications after delivery?
[ ] Yes
[ ] No
If yes, answer #35; if no, skip to 36

35. What type of complication?
[ ] The baby came too early or too small
[ ] Fever
[ ] Hemorrhage
[ ] Bad Blood (Mauvais sang)
[ ] Vodou curse
[ ] Seizure or Headache or Preeclampsia
[ ] Baby died
[ ] Baby did not fit; needed emergency cesarean

36. Did you breastfeed your baby?
[ ] Yes
[ ] No
If yes, answer #39-41; if no, skip to #42.

37. Are you breastfeeding now?
[ ] Yes
[ ] No

38. How long did you breastfeed?
[ ] <3 months
[ ] 3 months-6 months
[ ] 6-12 months
[ ] 12 months to 2 years
[ ] more than 2 years

39. How old was the baby when you started feeding him food or water?
[ ] <3 months
[ ] 3-6 months
[ ] 6-12 months
[ ] 12 months to 2 years

[ ] older than 2 years
Now skip to #43.

40. Why did not you not breastfeed?
[ ] Don't like
[ ] It hurts
[ ] No milk
[ ] Too sick
[ ] My partner does not want me to

41. After having one baby, how long should you wait before having another one?
[ ] 3 months or less
[ ] 4-6 months
[ ] 6 months -1 year
[ ] 2 years
[ ] more than 2 years

42. After your last pregnancy and before your next pregnancy, did you have your period?
[ ] Yes
[ ] No

43. Did anyone talk to you about birth control after your last delivery?
[ ] Yes
[ ] No

44. Overall, how many children do you want to have?
List number:

45. Overall, how many children does your partner want to have?
List number :

46. Have you ever used a birth spacing method?
[ ] Yes
[ ] No

47. Have you ever used modern contraception ? such as pills, injection, device inside the uterus
[ ] Yes
[ ] No
If yes, answer #49 ; if no, skip to #58

44

48. How long have you been using your modern contraception ?
[ ] less than 3 months
[ ] 3-6 months
[ ] 6-12 months
[ ]12 months to 2 years
[ ] more than 2 years

49. What is the brand name ?
Name :

50. Where did you obtain it ?
Name of clinic :

51. Were you told about any side effects ? for example Headaches, bleeding, nausea, depression
[ ] Yes
[} No

52. Were you told about alternatives ? for example : condoms, sterilization, IUD, etc.
[ ] Yes
[ ] No

53. Have you experienced side effects ? for example Headaches, bleeding, nausea, depression
[ ] Yes
[ ] No

54. What was the side effect ?
[ ] Feel sick
[ ] Headache
[ ] Bleeding
[ ] Other (Please List) :

55. Did you feel comfortable discussing your symptoms with the clinic staff ?
[ ] Yes
[ ] No
If no, answer #56 ; if yes, skip to 57.

56. Why did you feel uncomfortable discussing your symptoms ?
Describe :

58. Which traditional method did you use ?
List :

59. Do you or have you considered using breastfeeding for contraception?
[ ] Yes
[ ] No

60. Have you ever used any kind of family planning (modern, traditional, or breastfeeding)?
[ ] Yes
[ ] No
If yes, answer #61; if no, skip to #62

61. What are the reasons you used family planning? (Check all that apply)
[ ] I do not want to have any children at all.
[ ] I have as many children as I want already.
[ ] I want to wait a certain number of years before having another child.
[ ] My partner does not want any children at all.
[ ] My partner does not want any more children.
[ ] I want to go to school before having a child.
[ ] I want to have a job before having a child.
Now skip to #65.

62. If no, would you ever use contraception?
[ ] Yes
[ ] No
If yes, skip to #64; if no, answer #63

63. If no, what is the primary reason you decided never to use contraceptives to control birth spacing?
[ ] God gives babies
[ ] Religious reasons
[ ] Varicose veins
[ ] will make me sick

[ ] not yet
[ ] no stable partner
[ ] no chance to get methods
[ ] People say if I use FP I will not have children
[ ] I have never had a period
[ ] FP makes women hemorrhage
[ ] It gives me asthma
[ ] It makes you not have your menstrual period
[ ] do not know
[ ] Other reason (specify)
[ ] it is too expensive
[ ] clinic is too far
[ ] don't know where to go
[ ] the method I desire is not available
[ ] Husband/partner didn't want me to use birth control or kept me from using birth control

64. What method would you prefer to use?
1 Pills
2 injection
3 mucus method
4 Withdrawal
5 lactation amenorrhea
6 Abstinence
7 condom
8 Norplant
9 Depo provera
10 tubal ligation
11 Vasectomy
12 condom for women
13 Traditional method

65. What was the last family planning method you used?
1 Pills
2 injection
3 mucus method
4 Withdrawal
5 lactation amenorrhea
6 Abstinence
7 Condoms
8 Norplant
9 Depo provera
10 tubal ligation
11 Vasectomy
12 condom for women
13 Traditional method

14 None

66. How much did the method/s cost?

67. Who recommended/taught you this birth spacing method?

68. Were you satisfied using this method?

        1   Yes
        2   No

69. If yes, what are the reasons for being satisfied or tell us why?

70. If no, what are the reasons for not being satisfied or tell us why?

71. Do you prefer to obtain supplies/discuss contraception with a man, a woman or have no preference?

72. How close is the nearest clinic to you ? (range of minutes)
[ ] 0-15 min
[ ] 15-30 min
[ ] 31-45 min
[ ] more than 45 min

73. If you had a clinic closer to your home, would it make it easier for you to go?

74. Have you ever had a pelvic exam?

75. Would you be willing to have a pelvic exam prior to beginning birth control?

76. How far do you travel to obtain contraceptive supplies?

77. How much do you think birth control pills should cost?

78. How much do you think condoms should cost?

79. Would you prefer to receive birth control in your home? or at the clinic?
[ ] home   [ ] clinic

80.a)What would you think of having someone give you an injection at your home?
   [ ] yes   [ ] no

80. b) bring you birth control pills or condoms to your home?
   [ ] yes   [ ] no

81.   Would receiving an injection every 3 months be acceptable to you?
     [ ] yes   [ ] no

82. Would having a small surgery to put a birth control device under your skin be acceptable to you?
      [ ] yes [ ] no

83.   a) Have you heard of the IUD?
      [ ] yes [ ] no

b) Would you be willing to have a small surgery to put a device in your uterus for birth control? Would this be acceptable to you?
      [ ] yes [ ] no

c) Of all the choices mentioned above: The IUD, The small device under the skin, the pill, the shot, or condoms, which would you prefer?
[ ] pill   [ ] iud   [ ] injection

84. What does/would your partner think about contraception use?

Male Survey

1. How old are you?
List age:

2. Are you married?
[ ] yes
[ ] no

3.How many children do you have?
List number:

4. How many children did you want to have?
List number:

5. How old were you when you had your first child?
List age:

6. How old were you with your next child?
List age:

7. How long did you want to wait before your next child?

8. Do you know if there is a best period of time to have the next child?

9. What family planning methods have you heard of before?
[ ] condoms
[ ] pills
[ ] male sterilization
[ ] female sterilization
[ ]IUD
[ ] injection
[ ] tube under the skin

10. In the last few months have you discussed the practice of family planning with a health worker or health professional?

11. If person is married: who decides if the couple should use family planning?
[ ] man
[ ] woman

[ ] family members

12. Do you think a woman who is breastfeeding can have a baby?
[ ] yes
[ ] no

13. What do you think of the following statements?
Agree, disagree, don't know

14. Contraception is women's business and a man should not worry about it.
[ ] agree
[ ] disagree
[ ] don't know

15. Women who use contraception may become promiscuous.
[ ] agree
[ ] disagree
[ ] don't know

16. What form of contraception have you or your partner used in the past?
[ ] condoms
[ ] pills
[ ] male sterilization
[ ] female sterilization
[ ] iud
[ ] injection
[ ] tube under the skin

17. Do you know where a person can get condoms?
[ ] yes
[ ] no

18. Where is that?
List name:

19. Any other place?
List name:

20. How much do they cost?
List amount:

21. If you wanted to, can you yourself get a condom?
[ ] yes

[ ] no
[ ] don't know

22. Would you ever consider male sterilization?
[ ] yes
[ ] no

Barriers to Care Questions

1. Have you ever been to the hospital?
1 Yes
2 No

2. Which one?
1 Leogane
2 Port-au-Prince
3 Jacmel
4 Other (specify)

3. Have you been to the hospital in the last year?
    1   Yes   2 No

4. What was the reason you went to the hospital?
1   Check your health status in general
2   Pain
3   Fever
4   Bleeding
5   Delivery
 6   Other -specify

5. How did you get to the hospital?
1 By foot
2 On animal
3 By bus
4 On tap-tap
5 On Stretcher
6 Private Vehicle
7 Precise, Other way (specify)

6. If it's the hospital in Leogane, how long does it take you to get there?   (Hours)

7. What is the primary reason you would not have wanted to go to hospital?

8. Last time you decided not to go to the hospital, what was the primary reason?
1. Need to take care of children/home
2. Partner doesn't want
3. Family doesn't want
4. Fear of mistreatment
5. No money
6. No transportation
7. Prefer traditional medicine
8. Fear complications
9. Got better
10. Other

9. Last time you decided to go to the doctor, how was the experience?
[ ]Bad
[ ] Indifferent
[ ] Good
Why?

10. Last time you went to the doctor did you get cured (you felt better), no change or worse?
[ ] felt better
[ ] no change
[ ] worse

11. Have you ever been cured(felt better) by the doctor?
[ ] yes
[ ] no

12. Have you ever had a complication or become worse after visiting the doctor?
If yes, did you go back?
If no, where did you go?
[ ]Another doctor
[ ] Stayed home
[ ] Church/Prayer. Ougan. Dokte fe.
[ ]Mambo. Matwon

13. Have you ever stopped following the doctor's

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recommendations or stopped taking your medicines?
If yes, why?

14. Has your doctor taken money for himself/herself? Has this kept you from going back when you are sick?

15. Have your community leaders taken money for themselves when it should have been used to treat sick people? Has this kept you from going back when you are sick?

16. Has anyone at a hospital refused to take care of you because you could not pay? Has this kept you from going back when you are sick?

17. Where do you buy your medications?
pharmacy
drug store
clinic
hospital

Abortion Questions

1.Have you ever had an abortion/miscarriage? Lost a pregnancy spontaneously or desired to end a pregnancy?
1 Yes   2 No (go to question 41)

2. If you had an abortion/s or miscarriage, how many?

3. Were the abortion(s)/miscarriages intentional or an accident?)
1-intentional
2-accidental

4. If the abortion(s)/miscarriages were intentional how many?

Please fill in for each intentional abortion
5. Number voluntary abortion

6. How many months of pregnancy

7. Who helped you doing the abortion?
1- doctor
2- nurse
3- Midwife
4- Family
5- Neighbor
6- None
7- Who else(specify)

8. What did they use to do the abortion
1- Traditional medicine
2- Touching it
3- Tools
4- Tea
5- Vodou magic
6- Other thing (specify)

9. Did you have problems after the abortion, or the miscarriage?

1- yes
2-no

10. What kind of complication
1- No complication
2- Fever
3- Bleeding
4- Dizzy spell
5- Don't remember
6- Other complication –specify
7- Continued pregnancy

11. Did you have to go to hospital for the complication?
1- yes
2- no

12. Did you feel you could go? If not why?
You were afraid you would be treated badly?
It would be expensive?
People would know?

Restavek children

1. Have you ever needed to send a child to live with another family?

How did it work out?
Was there any contract or document concerning conditions for the child?

How do you see your current and future relationship with the child?

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