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# **Birthing trends in Sierra Leone**

*EXAMINING THE FACTORS THAT DETERMINE WOMEN'S CHOICES DURING  
CHILDBIRTH*

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Class of 2019

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## **Introduction**

Throughout time, safe birthing has been one of the greatest challenges in maintaining a stable human population. Women all around the world choose to carry children and go through what is often viewed as the sacred ritual of childbirth. The biological process is the same, but the experience and transformative nature of birthing is context-dependent. In many parts of the world, significant numbers of women die during delivery from causes that are preventable. These deaths are often a reflection of the quality of and access to healthcare. It is important to identify barriers to quality healthcare in order to help tackle the high rates of maternal mortality wherever they persist. In this paper, I attempt to identify such impediments in Sierra Leone.

Using the survey data that I collected in Sierra Leone in the summer of 2018 in combination with publicly available Demographic Health Survey (DHS) Sierra Leone data, I will attempt to identify the factors that affect choices during delivery i.e. at home or in modern medical facilities. From the DHS data, I expect to get general measures of birth place and background characteristics on a large sample of women, and from my data I expect to obtain more nuanced/fine-grained answers from a local sample. In the conclusion of this paper, I offer suggestions as to how the quality and accessibility of pre- and post-natal healthcare can be improved in ways that may significantly reduce maternal and infant mortality in places where they have remained high.

From the research, I found support for the hypothesis that being poor does have an effect in the likelihood of someone delivering at home. The more antenatal visits the less likely women are to give birth at home. That is for every additional antenatal visit the less likely it is for delivery to take place at home. If the geography is rural, it is also more likely for delivery to happen at home. From my cohort, psychosocial needs outweighed the physical structure and amenities of a facility. No participant who delivered at home reported a negative experience as

their birth attendant (called grandmother or mamie) addressed their psychosocial needs. Participants reported that the mamies gave them encouragement, they told them that they will go through it and interacted with them patiently. Pain management was mentioned by a few participants, but majority of the satisfaction ratings reflected psychosocial factors. Women were more concerned about the encouragement they received, support and communication with the skilled health worker.

### **Background: Infant and Maternal Mortality in Sub-Saharan Africa**

Childbirth has always been, in every era, place and culture, one of the leading causes of death of women and the leading cause of death of newborns. Historically, child birthing included use of various positions for delivery, including straws on the ground for absorption and birthing chairs or stools (Greene, 2015). It was a sacred ritual process for women assisted by women.

Infant and maternal mortality rates are, by global standards, very high in most Sub-Saharan African countries. In this section, I will provide details about the high mortality rates and provide possible explanations. According to UNICEF 2019 Children in Africa database, Africa's child population will reach 1 billion by 2055, making it the largest child population amongst all continents. Based on continuation of current coverage, more than 300 million of Africa's 730 million projected births through 2030 will not be attended by skilled health personal. The database also states that mortality rates among children under age 5 decreased by 58 per cent between 1990 and 2017 however, over half of the world's 5.4 million under-five deaths in 2017 occurred in Africa. Children born in Sub-Saharan Africa today have a life expectancy of 51 years, and almost 10% of them die in the first year of life. 155 out of every 1000 children born today do not reach the age of five. Infant mortality rates are particularly high in the first month of life, with a neonatal mortality of 40 out of every 1000 live births (UNICEF

2019), neonatal deaths account for about a third of under-five deaths globally (1.1 million newborns die in the first month of life) (USAID 2012). This leaves Sub-Saharan Africa with the highest risk of death in the first month of life and is amongst one of the regions showing the least progress.

Despite a substantial fall in the rate of infant mortality, those improvements have been insufficient to achieve Millennium Development Goal 4 which set to reduce infant mortality by two-thirds, between 1990 and 2015, as a goal for Sub-Saharan African countries. They have seen a faster decline in their under-five mortality rate, with the annual rate of reduction doubling between 1990–2000 and 2000–2011. Sub-Saharan Africa (SSA) has reduced under-five mortality by 39% between 1990 and 2011. The highest rates of child mortality are still in Sub-Saharan Africa—where 1 in 9 children dies before age five, more than 16 times the average for developed regions (1 in 152). Under-five mortality rate in Africa (per 1,000 live births) declined from 163 in 1990 to 100 in 2011. In Eastern and Southern Africa, the decline was from 162 in 1990 to 84 in 2011. In West and Central Africa, the decline was from 197 in 1990 to 132 in 2011. Eastern and Southern Africa have reduced under-five deaths by 48% from 1990 to 2011. Western and Central Africa have reduced under-five deaths by 33% from 1990 to 2011. Liberia, Rwanda, Malawi, and Madagascar are among the top ten countries with the greatest percentage decline in their under-five mortality rates from 1990-2011. The under-five mortality rates decreased in these countries by 67.5%, 65.4%, 63.6%, and 61.8% respectively (USAID 2012).

Various studies looked into immediate factors that lead to infant mortality: 38% of infant mortality is due to infections, 25% to prematurity, 24% to asphyxia, 6% congenital factors and 7% other factors (Mason 2007). Two thirds of newborn deaths could be prevented if all mothers and newborns had access to a small number of interventions that are well-known, feasible and

deliverable without complex technology. These include tetanus toxoid immunization as part of antenatal care, birth care by a skilled attendant, early and exclusive breastfeeding and warmth, and timely treatment for newborn illness (Mason 2007)—all of which are more likely to happen for mothers who give birth in medical facilities rather than in their homes.

While global maternal mortality rates declined from 385 deaths per 100,000 live births in 1990 to 216 in 2015 (Alkema et al., 2015), maternal mortality rates remain high in Sub Saharan Africa (500 per 100,000 live births) with significant geographical variations (WHO, 2015; Hansen and Schellenberg, 2016). For instance, mortality rates exceed 500 per 100,000 live births in fragile economies such as Guinea, Liberia, Sierra Leone, Central African Republic, Democratic republic of Congo and South Sudan (Alkema et al., 2015), three of which were severely hit by the Ebola epidemic. In SSA, three-quarters of maternal deaths are due to direct obstetric causes such as haemorrhage, sepsis and hypertensive disorders (Ronsmans and Graham, 2006; Khan et al., 2006; WHO, 2014), conditions that can easily be averted through skilled delivery and provision of emergency obstetric care. Meanwhile, utilization of skilled delivery remains low with only half of pregnant women giving birth with a skilled attendant and the rates are worse off in rural communities (WHO, 2014).

According to the WHO, family planning, prenatal care, skilled birth attendance and emergency obstetrics have been identified as the four most critical interventions in efforts to reduce maternal mortality in developing countries (WHO, 2005). The presence of a skilled attendant during the labor and delivery, which is when most maternal deaths occur, is shown to lead to a marked reduction in maternal mortality (Campbell & Graham, 2006). Countries in which this approach has already been implemented have maternal mortality ratios of less than

200 deaths per 100 000 livebirths, with some even lower (Campbell & Graham, 2006). Yet, many women (57%) in low-income countries deliver at home without skilled help (WHO, 2010).

Before turning to the research literature on facilities use (or lack thereof) we need to acknowledge the historical, cultural, and psychological impact of home birthing traditions in SSA. The psychosocial elements of labor and delivery are central to any woman's birth experience, but international efforts to reduce maternal mortality in low-income contexts have neglected these aspects and focused on technological birth. There is increasing attention and wider recognition that many women are deterred from facility-based delivery because the intrapartum care on offer does not satisfy the interpersonal and emotional aspects of this biopsychosocial event. In some settings, care is perceived as dehumanised (Bohren et al 2014) and a high prevalence of disrespect and abuse is beginning to be documented (Kruk et al 2014). Mothers world-wide have different experiences of healthcare services during pregnancy and childbirth. Experiences mothers have during childbirth are important as mothers' affect their future decisions regarding births as well as advice and the assistance, they may provide other women. In many countries women's future use of facility-based childbirth care is influenced by their previous encounter with facility-based care. Many women are reported to experience disrespectful, abusive, and neglectful care during childbirth which consequently violates the trust between the women and their care providers (Bowser and Hill 2010 and Bohren et al 2015). The attitude of health providers has long been reported as a strong determinant of a positive patient experience, more so than the technical skills of providers (Turkson, 2009). McMahon et al. (2014) in their qualitative study of women's experiences of disrespectful maternity health care and abuse during childbirth in the Morogoro Region of Tanzania, reported women experienced various forms of abuse such as verbal and physical abuse, as well as feeling ignored and

neglected. Bohren et al (2015) further stated that while women are generally at risk of abuse and disrespectful care, childbearing women are more vulnerable. They are often subjected to abuse that takes various forms including physical abuse, profound humiliation, verbal abuse, coercion, and neglect. Notwithstanding this, women's fundamental human rights as described in internationally adopted human rights standards and principles, includes the right to the highest attainable standard of health (WHO, 2014).

A number of authors have noted that as a response to these forms of abuse, participants stated they preferred to deliver at home or with traditional childbirth attendants, to avoid unpleasant experiences in the public health facilities. These findings are further supported by a qualitative study on health care users' and providers' accounts of the poor-quality childbirth care (Mselle et al., 2013). In this study, women again reported unpleasant experiences that resulted in their preference for a home birth without skilled birth attendants. McMahon et al. (2014) further reiterate that women in labor lack essential support and end up experiencing unpleasant healthcare situations such as neglect, physical and verbal abuse. These reasons all contribute to many women preferring to deliver at home.

### **Literature Review**

We have established that rates of infant and maternal mortality are high in much of Sub-Saharan Africa. This is partly due to lack of access and/or lack of use of modern medical facilities. In this section I will review the literature to see what prior researchers have found out about how women define and seek out satisfactory birthing experiences, and how those efforts, in turn, bear on their decisions about where to give birth—at home or in a facility.

***Birth satisfaction*** is a complex construct defining the woman's individual psychological and emotional appraisal of her birth experience (Sawyer et al., 2013). Studies specifically describing



women's perceptions of their birth experience in low-income contexts are relatively recent. The psychosocial aspects of care have often emerged as a smaller element of studies focused on the technical quality of skilled attendance or they have been identified in reviews as one of the deterrents to delivery in facilities in SSA (Moyer and Mustafa, 2013). Other authors have focused on attitudes and behaviours of healthcare workers (Mannava et al., 2015) or women's satisfaction (Srivastava et al., 2015)

It has been shown that a woman's experience of childbirth has immediate and long-term effects on women's health and quality of their relationship with their child (Jafari et al 2017). Mothers with pleasant childbirth experiences have greater self-esteem, stronger relationships with their child, and positive expectations of their future childbirths. In contrast, dissatisfaction with childbirth leads to a greater likelihood of postpartum depression, anxiety, post-traumatic stress disorder, impaired mother-infant bonding, fear of the next childbirth, and choice of future Caesarean section (Jafari et al 2017). More relevant to the present study is the possibility that perceptions of satisfaction and dissatisfaction may bear on women's decisions about where to give birth. No consensus exists as to which factors are most influential (Goodman et al., 2004). Pain is one of the first and most challenging factors (Ford et al., 2009). Its intensity and relief play a role in dissatisfaction with childbirth. A number of studies have shown that maternal satisfaction increases with reducing severity of labor pain (Orange et al., 2012). However, according to other studies, experiencing painful childbirth is not necessarily followed by women's dissatisfaction (Mohammad et al., 2014).

A number of measures have been used to assess birth satisfaction, such as the Mackey Childbirth Satisfaction Rating Scale (Goodman, Mackey, & Tavakoli, 2004), the Labor Agency Scale (LAS; Hodnett & Simmons-Tropea, 1987), Six Simple Questions (SSQ; Harvey, Rach,

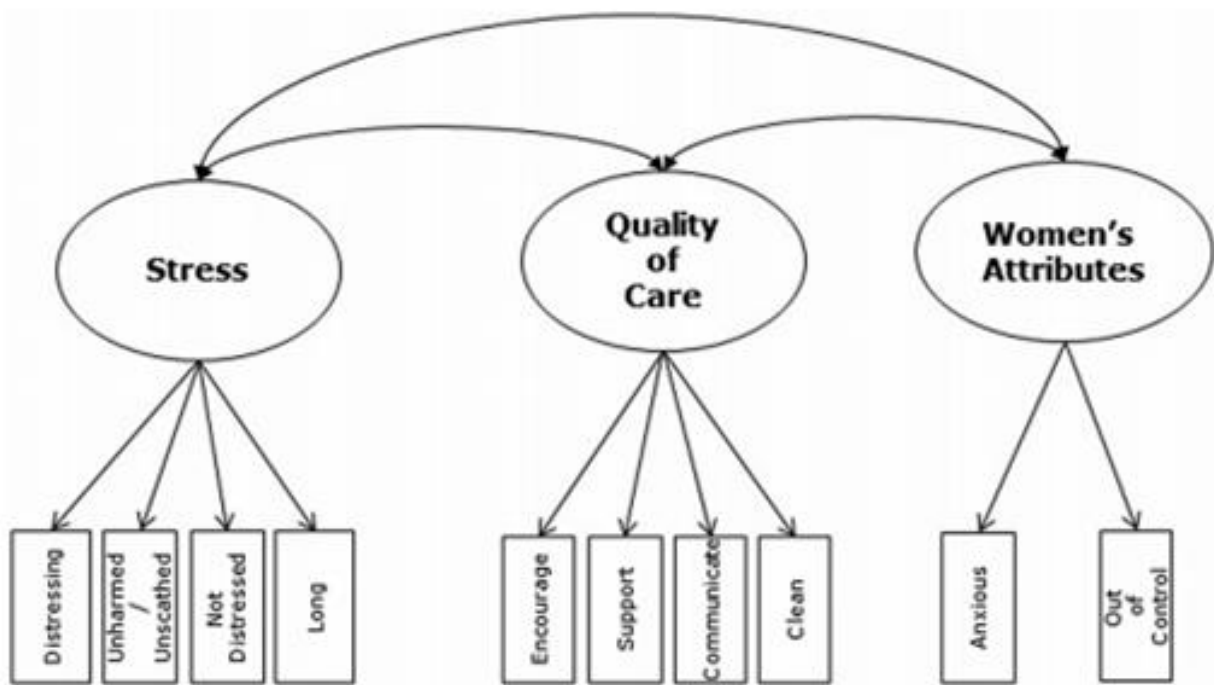
Stainton, Jarrell, & Brant, 2002) and the Perceptions of Care Adjective Check List – Revised (PCACL-R; Redshaw & Martin, 2009). These scales appear to be useful instruments which would be appropriate for research concerning other phases of maternity care as well as being more broadly applicable in evaluations of health care in quite different contexts (Redshaw & Martin, 2009). Examination of the items of the LAS suggest it is conceptually a locus of control scale in contrast to a satisfaction scale. Existing measures have been criticized for lack of coherence to established theoretical models of satisfaction and/or adequate information regarding questionnaire construction and validation (Sawyer et al., 2013).

Studies using these measures of satisfaction have shown us that the Labor Agency Scale, an instrument measuring expectations and experiences of personal control during childbirth, found an inverse relationship between anxiety and control, as well as evidence of construct validity. For example, subjects who had spontaneous, non-medicalized births had the highest Labor Agency Scale scores (Hodnett & Simmons-Tropea, 1987). In the SSQ studies, women in the midwife group reported significantly greater satisfaction and a more positive attitude toward their childbirth experience than women in the doctor group ( $p < 0.001$ ). Women experiencing low-risk pregnancies were more satisfied with care by midwives than care provided by doctors. Satisfaction scores were high for both groups and may have been lower for women in the doctor group as a result of disappointment with caregiver assignment as all women had sought midwifery care. The SSQ measures similar dimensions to the LADSI but the agreement is not strong enough to recommend its use as a substitute at this time. The significantly higher contentment of the women with the care provided by the midwives together with better clinical outcomes reported elsewhere suggest that the option of midwifery care should be accessible as an option for all women

Srivastava, Avan Rajbangshi and Bhattacharyya suggested that determinants of maternal satisfaction covered all dimensions of care across structure, process and outcome. Structural elements included robust physical environment, cleanliness, and availability of adequate human resources, medicines and supplies. Process determinants included interpersonal behaviour, privacy, promptness, cognitive care, perceived provider competency and emotional support. Outcome related determinants were health status of the mother and newborn. Access to health service location, cost, socio-economic status and reproductive history also influenced perceived maternal satisfaction. Process of care dominated the determinants of maternal satisfaction in developing countries. Interpersonal behaviour was the most widely reported contributing factor, with the largest body of evidence generated around provider behaviour in terms of courtesy and non-abuse. Other aspects of interpersonal behaviour included therapeutic communication, staff confidence, competence and encouragement to women in labor.

The Birth Satisfaction Scale-Revised (BSS-R) (see Figure 1), a quantitative measure examining women's satisfaction with labor experiences and outcomes, was developed and psychometrically validated in the UK (Hollins Martin & Martin, 2014) as a short-form version of the thematically developed Birth Satisfaction Scale (BSS; Hollins Martin & Fleming, 2011). Recently the BSS-R has been validated in the US (Barbosa-Leiker et al., 2015) as well as in Greece (Vardavaki, Hollins Martin, & Martin, 2015). Moreover, the tool's measurement invariance was also demonstrated across UK and Greek samples, providing further evidence of the tool's validity and cross-cultural utility (Vardavaki et al., 2015). The scale consists of one higher-order factor, experience of childbearing, containing three lower-order factors, quality of care provision (four items reflecting home assessment, birth environment, support and relationships with health care professionals), women's personal attributes (two items reflecting

ability to cope during labor, feeling in control, childbirth preparation and relationship with baby) and stress experienced during labor (four items reflecting distress, obstetric injuries, receiving sufficient medical care, obstetric intervention, pain, long labor and baby's health).



*Figure 1: Birth Satisfaction Scale-Revised*

*Source: Burdella et al.*

In a study of obstetric analgesia for vaginal birth in contemporary obstetrics in Nigeria, researchers Lawani, Eze, Anozie, Iyoke and Ekem (2014) found that pain relief during labor is desired by many women and contributes immensely to their satisfaction of the experience of childbirth, however, other researchers have discussed the influence of other factors. Unrelieved, labor pains may impact negatively on the lives of a pregnant woman to such an extent that her baby and family may also be affected. A long, painful labor may leave a mother exhausted, frightened, hysterical and even incapable of making decisions. Severe labor pains could result in

mental health disturbances which may interfere with maternal–neonatal bonding and future sexual relationships. It may also contribute to postpartum depression and rarely, to post-traumatic stress disorder (Lawani et al., 2014).

*Place of birth*—the decision whether to give birth at home or in a facility—is a complicated matter in much of SSA. Despite an emphasis on facility-based birth with skilled providers, many women still choose to deliver at home, due in part to poor conditions in healthcare facilities or because of perceived or verified abuse/coercion/ neglect at these facilities. International and national organizations have documented the lack of quality care and professional accountability at birthing facilities and various types of abuse. These include physical abuse, non-consensual treatment-centered care, and discriminatory care, which have been termed ‘disrespectful/abusive care during childbirth in facilities’ (DACF) (Miller et al., 2015). Evidence collected in diverse settings document associations between poor quality care and negative maternal and newborn health outcomes. Women via word of mouth recount their experiences to each other. A 2014 review of maternal and newborn quality of care found that improving access to facilities did not guarantee improved maternal outcomes. In the same year, the WHO published their statement on disrespect and abuse in facilities and called for greater action, dialogue, research, and advocacy on disrespectful and abusive treatment (Miller et al., 2015). Low government spending on health leaves health systems under-resourced, which is reflected in poor infrastructure and lack of equipment and drugs. In many countries, serious staff shortages have been tackled by the use of generalist nurse-midwife cadres. Unfortunately, they may lack the midwifery-specific interpersonal skills needed to operate in the culturally and emotionally sensitive arena of childbirth (Fauveau et al., 2008). This is not saying that women are better off delivering at home but this is a possible explanation for the choice to deliver at

home. However, because of the unpredictability of delivery it is important to be monitored during the process. Indeed, there has been a tendency to view the psychosocial elements of care as unrelated to quality and safety, and a luxury that is only affordable in high-resource settings (Bradley et al., 2015).

Psychosocial elements of care refer to the interrelation of social factors and individual thought and behaviour that affect care seeking of parturient. The Sierra Leone DHS surveys in 2008 and 2013 asked women if they had problems with accessing healthcare for themselves when they were sick or required treatment. Although this information is not specific to seeking care for maternal health problems, it can give a general indication of access issues that women face. In both 2008 and 2013, obtaining the money needed for advice or treatment was the most frequently reported problem, although there was a significant decrease of 13 percentage points between surveys. This implies that, even though the free health care reform was put into place in 2010, 67% of the women interviewed in 2013 still reported that money posed a problem for accessing health care. The problems of distance to health facility and not wanting to go alone also decreased between the two surveys. The problem of getting permission to go to the facility significantly increased, by approximately 10 percentage points between the two surveys. Further subgroup analysis shows that the problems of permission to go for health care were reported most by women in the youngest age group in 2008, and for both the youngest and oldest age groups in 2013. Since delays in the decision to go to a health facility can place mothers at risk if medical complications should arise, this increase is of particular concern since it disproportionately affects women in the high-risk age groups.

The results of an investigation by Guliani, H., Sepehri, A., & Serieux, J, (2012) support the view that a woman's decision regarding the place of childbirth is jointly determined by the

observed individual-level characteristics such as age, birth order, level of education as well as by unobserved community-level characteristics such as the availability and access to prenatal and facility delivery. A previous history of pregnancy and delivery related complications that predispose birthing women to seek prenatal care, also make them more likely to give birth at a health facility. The strength and magnitude of the number of prenatal visits, maternal age and education, parity level, and economic status of the birthing women on the place of delivery is seen to have an effect across sub-Saharan regions. They saw that the amount of prenatal contact on the place of delivery rises sharply with an increase in the number of prenatal visits (Guliani et al., 2012).

Based on existing theoretical frameworks, sex of the child, place of residence, birth intervals and maternal education are also significant predictors of child survival (Atuoye et al 2017). The research by Atuoye, K. N., Amoyaw, J. A., Kuuire et al., indicated that the number of births in the past one year, sex of the child and sex of the household head are the factors associated with increased risks of infant mortality rates in Uganda, site of study, and sub-Saharan countries. All the above-mentioned factors relate to insufficient child spacing, customs and norms practised by families and communities, and lastly family related problems (such as family violence). From the results, women who had given birth to more than one child in the year had their children at a higher risk of death before reaching the age of five. Female headed households were associated with an increased risk of under-five mortality than those that are headed by the males. Since in most of the tribes in the country, a man is considered to be the breadwinner and head of the household, finding a household headed by a woman is directly linked to a family that is insecure in a number of ways such as food availability and previous history of home violence. In another study, wealth of the mother was seen to be indirectly

correlated with infant and child mortality in SSA because they are able to afford and access healthcare. It also showed that mother's education was indirectly correlated with infant and child mortality in SSA (Anyamele 2012).

Culture and faith play very significant roles in perceptions of ill health, perceptions of care received and in predicting future use of health facilities. Some women report that they did not consider pregnancy and delivery as illnesses and, therefore, not worthy of a trip to a medical facility (Gebrehiwot, 2012). They perceived delivery as a natural process, an ordinary event that has been managed at home for generations. Previous non-complicated home deliveries further helped to reinforce this perception of delivery as a non-illness process (Gebrehiwot, 2012). High workload (83.2%), poor support from facility management (40%), and the discomfort of the work environment (28%) revealed by a study in Ethiopia showed how difficult the facility-based births are for medical professionals (Asefa et al. 2018). With a monitored pregnancy, most women experience successful childbirth, whether at home or in facility, and most babies are born healthy. Complications during childbirth, however, often cannot be predicted. For this reason, all women and babies require access to childbirth care from skilled care providers. Timely recognition and management of complications during childbirth is important, as is avoiding unnecessary medical interventions. The development of the WHO Safe Childbirth Checklist Implementation Guide for Improving the Quality of Facility-based Delivery for Mothers and Newborns, has a list of items to check for. When this checklist is utilized effectively, it can lead to the improved health of the mother and baby. The push in facility-based births helps with routine infection prevention practices, the use of a partograph as an effective tool for monitoring the progress of labor, active management of the third stage of labor, hygienic cutting and tying of the umbilical cord, resuscitation if needed, essential newborn care (warmth, early and exclusive



breastfeeding, and cleanliness), prevention of mother-to-child transmission (PMTCT) of HIV. These efforts also increase client satisfaction and comfort, for example providing privacy, limited vaginal exams, permitting free movement, improved nutrition encouraging use of a social companion at birth, and establishing a supportive relationship.

Montagu et al (2011) conducted a secondary analysis of maternal delivery data from Demographic and Health Surveys in 48 developing countries from 2003 to 2011. From their study, they concluded that “in developing countries, most poor women deliver at home. This suggests that, at least in the near term, efforts to reduce maternal deaths should prioritize community-based interventions aimed at making home births safer” (Montagu et al 2011). From the results only about a quarter of the poorest women reported lack of facility access (i.e. the facility was too far away, or was closed, or the woman did not know where it was located) as the chief reason for delivering at home. About two-thirds of the participants who were of the poorest women reported “not necessary” as the chief reason. “This motivation for delivering at home is likely to be influenced by social and cultural beliefs, at the household and community levels, related to the value of facility-based care” (Montagu et al 2011). In this study, cost was rarely cited as a motivation for delivering at home. In this study differences in social and cultural settings of the countries was not accounted for. It also did not touch on ways to make home delivery safer.

Bohren et al (2014) conducted research in 17 countries and they found that the emphasis placed on increasing facility-based deliveries by public health entities has led women and their families to believe that childbirth has become medicalized and dehumanized. “When faced with the prospect of facility birth, women in low- and middle-income countries may fear various undesirable procedures such as unfamiliar birthing positions, intrusive vaginal exams and

unnecessary surgical interventions and may prefer to deliver at home with a traditional birth attendant. Given the abundant reports of disrespectful and abusive obstetric care highlighted by this synthesis, future research should focus on achieving respectful, non-abusive, and high-quality obstetric care for all women” (Bohren et al, 2014). The push for facility-based births has also been hindered by the fear of stigma. For example, the fear of unwanted HIV-status disclosure might prevent women from accessing delivery in a healthcare facility, as the lack of privacy in maternity wards impedes confidentiality (Turan, 2012). Many communities view pregnancy and childbirth as the outcome of a marital relationship, thereby potentially stigmatizing and disempowering unwed women from seeking facility delivery. Delivering at home was a desirable choice for unwed women or adolescents to avoid embarrassment or discrimination at a facility, particularly because these women were often lacking emotional and financial support from their partner or parents (Oyerinde et al 2012). In summary, affinities for traditional birthing practices and fear of mistreatment combine to keep many women from birthing in facilities.

Meanwhile, the maternal mortality ratio (MMR) for Sierra Leone remains high at 622.6 per 100,000 live births (Kassebaum et al. 2013), compared to the global MMR of 209.1 per 100,000 live births (Kassebaum et al. 2013). Oyerinde et al. recommended an increase in health facility delivery as among the measures to reduce maternal mortality. This strategy was advocated by the government in 2009 (Sierra Leone Ministry of Health and sanitation 2010). Recent studies conducted in Sierra Leone identified prohibitive costs to be one of the main barriers for women accessing maternal healthcare and utilizing facilities during childbirth (Herschderfer et al. 2012).

In 2010, in response to these findings, the government of Sierra Leone introduced the Free Health Care Initiative (FHCI) for pregnant women, breastfeeding mothers and children under the age of 5. A local-level initiative has also been introduced in the form of ‘bylaws’ (Herschderfer et al. 2012). The bylaws are described as a way to stimulate ‘facility care’, implying that women are required to attend antenatal care and give birth at a facility. The laws are put in place by local authorities (typically chiefs), and women, husbands and occasionally Traditional Birth Attendants (TBA) can be fined if they do not comply (Herschderfer et al. 2012). The role that these laws actually play in local communities remains unknown. With the introduction of FHCI, health facility deliveries initially increased at a rapid rate, reaching 54% in 2010 (Sierra Leone Ministry of Health and Sanitation 2012) but with a minimal increase to 54.4% by 2013 (Statistics Sierra Leone 2013). These estimates remain lower than the Government’s target of 90% of births being in a healthcare facility by 2015 (Sierra Leone Ministry of Health and Sanitation 2012). Utilization of health facilities differs between urban and rural areas: 68.1% and 49.7% respectively. These inequalities persist for delivery with a skilled attendant: 78.9% delivering with a skilled attendant in urban areas and 53.2% in rural areas (Statistics Sierra Leone 2013). Other countries that have implemented free or reduced costs have also found that this effort alone does not ensure access to maternal healthcare for all (Shiferaw et al. 2012)

Studies have highlighted the importance of context-specific research when exploring reasons behind utilization or non-utilization of health facilities (Shiferaw et al. 2012). Researchers have increasingly considered the experiences, perceptions, preferences and perceived risks of the ‘service-user’ during pregnancy and delivery to gain a deeper understanding of both decision-making processes and health-seeking behavior within specific

contexts (Jambai et al 1996). Studies conducted before the introduction of FHCI in Sierra Leone found that barriers to accessing care at health facilities included prohibitive and unreliable costs, geographic inaccessibility, distance, lack of transport, and lack of supplies and human resources (Herschderfer et al. 2012)

From past and current research about maternal and child health we are able to deduce that both psychosocial factors and quality of facilities and health workers are important in understanding what drives satisfaction rates and in turn the decision to deliver at home or in a facility. From my analysis of birth satisfaction, I expect to answer the question if psychosocial needs outweigh the physical structures and technology available in care, in my small local sample set and to obtain more nuanced/fine-grained answers from the same sample regarding satisfaction ratings. For the larger sample I want to assess whether poverty, access (ie location) and number of antenatal visits drive the choice to deliver at home or in facilities. Exploring these two angles will help to pin point how birthing can be moved to facilities as recommended by healthcare agencies in Sierra Leone and identify areas of improvement to increase retention rates.

## **Data and Methods**

For the analysis, two data sets are used; the Demographic Health Survey (DHS) database and primary data collected in Sierra Leone in summer of 2018. The DHS database is used to assess the relationship between birth place and background characteristics in a large sample of women. The DHS is administered regularly by the United States Agency for International Development (USAID). DHS are nationally-representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. The DHS file analyzed here was collected through questionnaires and

includes responses of over 16,000 women aged 15- 49 from throughout Sierra Leone from June 2013 - October 2013.

From the primary data I expect to get more nuanced/fine-grained answers regarding birthing experiences and birth place choices from a local sample. All participants, who were women, were randomly selected from different locations around Sierra Leone. Each participant was approached at the local market areas, children hospitals, religious places of worship and other public places. They were asked if they had any children younger than 10 years old and if they would take a few moments to answer some questions about their delivery experience. Based on one's willingness to participate, the consent form was translated and read aloud, and the participants offered their informed consent and acknowledged their rights. The questions in the survey were then asked and the participant's responses typed into the google form. Each participant was then given a local equivalent of \$1 US for their participation.

The Demographic Health Survey asks women where they gave birth to each of their children. In this study, I treat "place of delivery" as a key dependent variable, using the DHS database with variable <M15 > which based on answers to the question, "place of delivery". The variable <M15 > distribution was recoded as Delivery at home. All respondents who delivered at home was given a value of 1 and delivery anywhere else was assigned a 0. There is also a variable in the data set indicating the "number of antenatal visits" women made to medical facilities during their pregnancies which I hypothesize is predictive of giving birth in facilities. I used the Demographic Health Survey database with variable <M14 > which based on answers to the question, "Number of Antenatal visits throughout pregnancy". Both of these factors are likely related to women's socioeconomic standing, so I also include the DHS wealth index in the analysis. It is an index based on V190. A variable indicating rural residence based on index V025

is included for similar reasons. (see figure 1). Both variables were similarly recoded with rural assigned a 1 and everywhere else a 0, poor was assigned a 1 and every other wealth variable a 0.

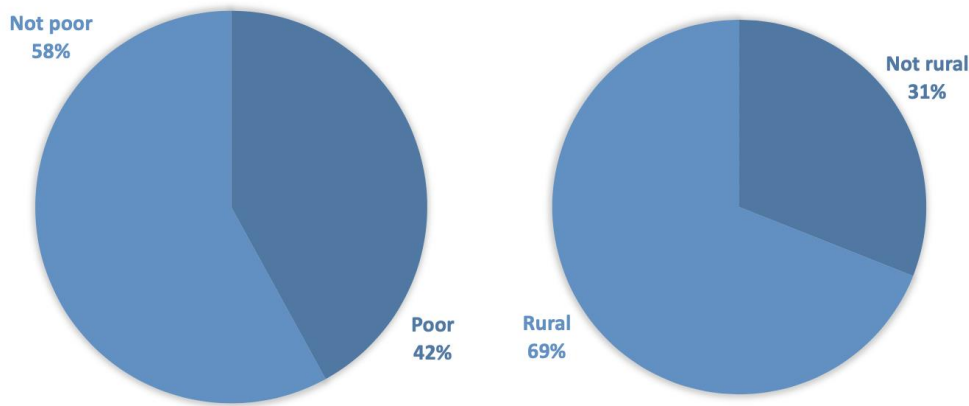


Figure 1: Distribution of Poor and Rural location of population

After illustrating patterns of birth place and birth satisfaction, I will use Ordinary Least Squares (OLS) regression with 3 different social factors to identify the most significant predictors of place of delivery. With a significance (P) values less than 0.05, I will be taken as evidence that my hypotheses cannot be refuted. The R and R Squared values will also be included in the analysis. The unstandardized slope coefficients (B) column will be interpreted as a probability which can also be read as percentage values. Finally, qualitative responses collected from 100 Sierra Leonean will be analyzed to identify the most common sources of satisfaction and dissatisfaction.

In the end, we will have answers to the three pressing questions: 1) where do Sierra Leonean women most often give birth, at home or in modern medical facilities? 2) How satisfied are they with their birthing experiences, and why? 3) What factors lead to satisfying or dissatisfying birthing experiences, and how do they bear on decisions about where to give

birth? The answers to these questions are important because they will help to determine where interventions should be directed towards tackling maternal mortality in Sierra Leone.

### Findings

Figure 2 shows the distribution of places of delivery in Sierra Leone; 43% occurring at respondent's home or another “home” setting and differentiates various other points of service for delivery.

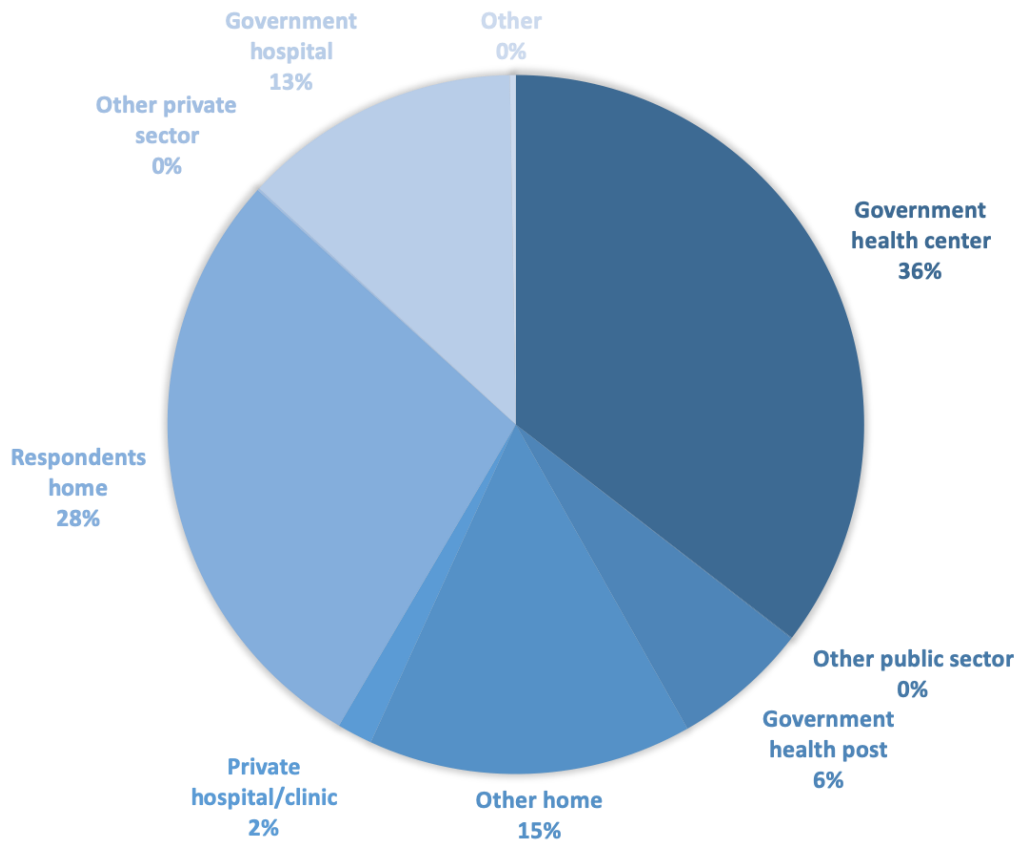


Figure 2: Distribution of Places of delivery.

Figure 3 is based on the recoding of the variable “place of delivery”. It shows that 43% of delivery take place at home and 57% takes place at varying facilities.

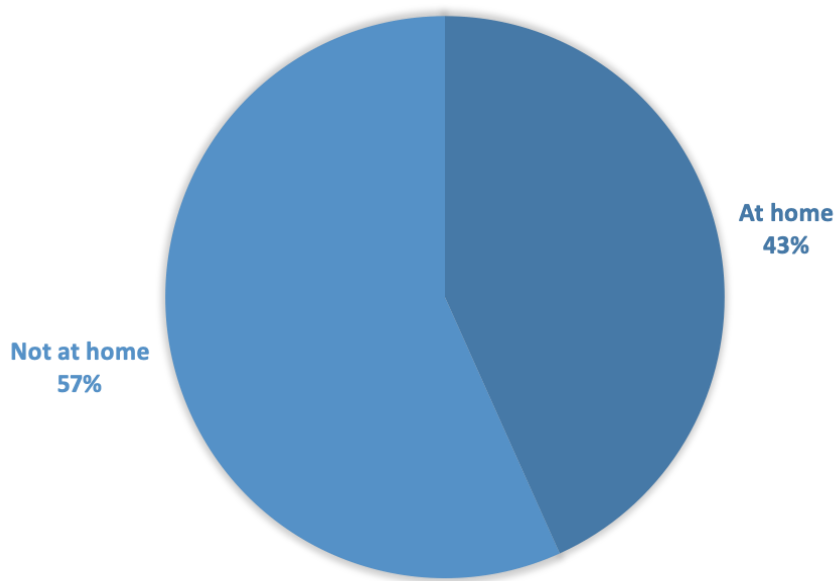


Figure 3: Distribution of place of deliveries at home

Figure 4 shows the distribution of antenatal visits reported by participants during pregnancy. Based on WHO recommendation of a minimum of 8 antenatal visits, over 4000 participants report less than 8 visits and about 2500 reported having over 8 visits.

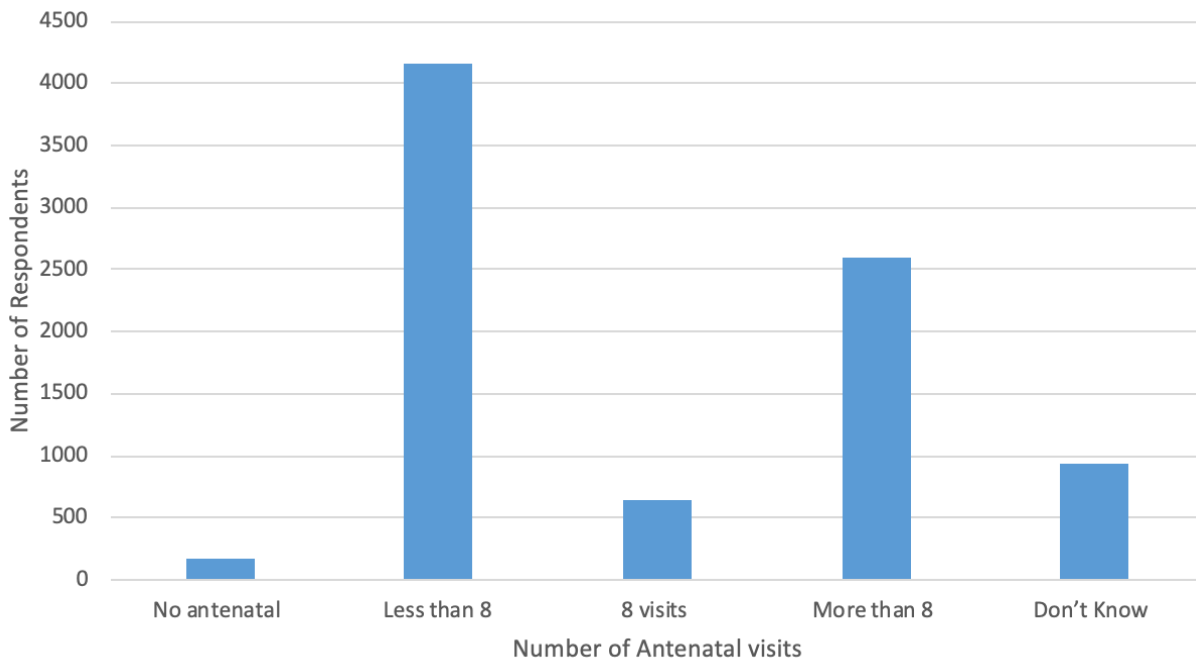


Figure 4: Distribution of Number of Antenatal clinic visits



Figure 5 below depicts the distribution of ratings of birth satisfaction among the sample survey in the summer of 2019. Participants recounted their experience of delivery for each child which provides a qualitative data and reflect satisfaction to be analyzed later.

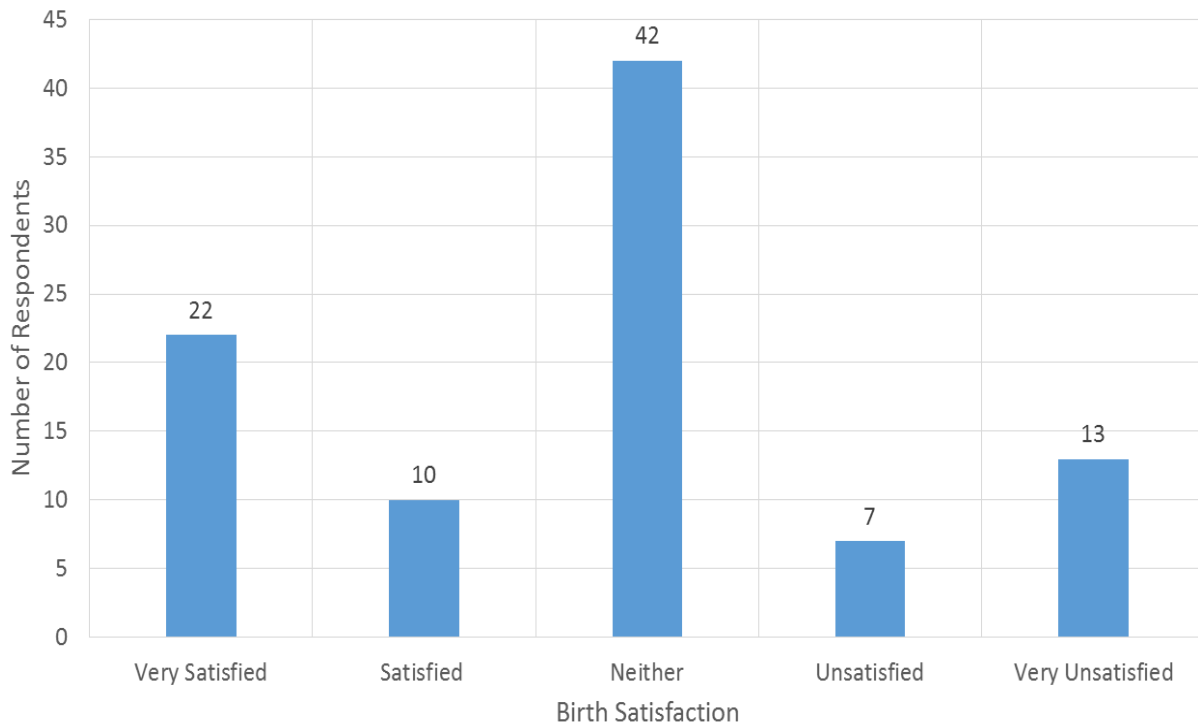


Figure 5. Birth Satisfaction in the Primary Data Set

#### *OLS Regression Results: Key Predictors of Home Birth*

As mentioned earlier, OLS is used here to identify statistically significant predictors of home birth. As seen in Table 1, for model one, whether or not a person is poor explains 16% of the variability in place of birth decision making. In model two, it is clear that 38% of the variability can be explained by being poor and living in a rural area and for the third model 42% of the variation can be explained by being poor, living in a rural area and the number of antenatal visits you have had. The correlations are all statistically significant at the ( $\alpha =$ ) .05 level

**Table 1: Number of Antenatal visits and Delivery at home**

Dependent Variable: Delivery at home			
Independent variable	Model 1	Model 2	Model 3
Poor	0.126*	0.04*	0.039*
Rural	---	0.179*	0.179*
Number of Antenatal visits	---	---	-0.001*
Constant	0.358	0.274	0.295
R <sup>2</sup>	0.016	0.038	0.042
n	8498	8498	8498

\*P<0.05

Source: Demographic Health survey.

From the coefficients table in the SPSS output, there is a 35.8% chance of delivering at home for those who are not poor. When accounting for being poor, 12.6% is added to the 35.8% leaving poor people with a 48.4% chance of delivering at home. In the second model, 27.4% of the population who is neither poor nor rural deliver at home. When wealth index and geography is controlled, being poor adds 4% and rural location adds 17.9% for the number of people delivering at home. Those who are poor and rural have a  $(.27 + .04 + .18)$  .49 or 49% chance of giving birth at home. In the final model, 29.5% of the population deliver at home, being poor adds 3% and rural location adds 17.9% to the likelihood of delivering at home. However, when number of antenatal visits are added it decreases by 0.1%. This means for every additional visit

to antenatal care during pregnancy, the likelihood of delivering at home decreases by 0.1%. All results are significant as the p values are less than 0.05 indicating statistical significance for all three predictors.

Based on the results of the regression, we reject the null hypotheses. The results agree that being poor does have an effect in the likelihood of someone delivering at home. The more antenatal visits the less likely this same effect can be seen. That is for every additional antenatal visit the less likely it is for delivery to take place at home. If the geography is rural, it is also more likely for delivery to happen at home.

#### *Qualitative Results: Key Determinants of Birth Satisfaction*

From Figure 5, we can see that 44% of respondents reported neither good nor bad for their experience of delivery. 23% reported very good experiences and 13% indicated that their experience was very poor. The responses of participants conveyed in the reason for the ratings in figure 5 is coded to highlight words that are commonly mentioned and the context of the mention. Using the formula “COUNTIF” on excel, the number of times the words like pain, doctors, nurses and midwives are mentioned is recorded. The response is categorised into positive and negative experiences to assess what vivid factors played a part in their satisfaction rating of the experiences.

As seen in table 2, participants mentioned the word nurse 220 times, doctor 40 times and midwife 20 times in terms of skilled workers and 48 times “mamie”, “grandmother” which refers to an attendant at home. The words pain, mentioned 164 times, encouraged was mentioned 52 times and rude mentioned 12 times. These words were mentioned in both negative and positive experiences.

**Table 2: Vocabulary Analysis**

Word	Number of mentions
Nurse	220
Pain	164
Doctor	40
Midwife	20
Encouraged	52
Rude	12

In positive reports of experiences, patients identified doctors and midwives but especially nurses as source of comfort during the process. A common theme was that the nurse was nice, patient, encouraging especially because it was the first birth or simply communicating with parturient throughout the process. There were also a few mentions about the interaction with anxious partners and family members. Some participants were allowed to have their partners or family members in the room during delivery. A 30-year-old woman who had given birth to 3 children said: “For all the deliveries the nurses were good. They treated me well. The nurse even gave me some water to bath after the delivery” A 27-year-old woman said “...then I delivered, the nurse and everyone treated me well. They treated my family well too and they talked to them nicely.” There more thorough accounts of how nurses comforted women going through the birthing process, like the following account offered by a 32-year-old mother giving birth to her 3rd child: “I was at home when the pain started. I went to the hospital at 4am and I delivered at 5pm. The nurse talked to me and encouraged me, they checked often.” There were several other similarly positive accounts of nurses providing useful service and comfort during the process. For home births some women noted that it was in the middle of the night so they could not make

it to the hospital, and others mentioned the support and patient the “mamie” or “grandmother” has during their delivery.

On the other hand, there were a number of negative experiences recounted by my respondents. Some participants reported varying levels of discomfort and others reported very traumatic experiences. A 34-year-old participant reported, “For my first born the experience was terrible, I had a premature rupture of membranes and had to wait 3 days before labor was induced. My husband was asked to leave and come back in the morning and nurses were very rude to me when I was scared to push. They called me a witch and said I had eaten my baby.” Another, with her now 9 months baby reported, “I delivered on the steps of the hospital by myself. It was early in the morning. I kept knocking on the door and they wouldn’t open the door.” With the child now 4 years old, a participant reported: “I didn't have the items to deliver so they would not attend to me. Eventually I had to beg my sister. I really struggled throughout. I experienced a lot of bleeding and my leg has problems since then.”

In sum, the results from the analysis of the DHS and primary data I collected in Sierra Leone suggest that: 1) in Sierra Leone most women deliver in facilities 2) most women reported being more satisfied than not with their delivery experience 3) the factors that seemed to bear weight in participants mentions of satisfaction or dissatisfaction had nothing to do with the physical location and amenities in the facilities but focused on the interactions with nurses and other health workers which were crucial to their comfort and satisfaction. Psychosocial needs outweighed the physical structure and amenities of a facility for feelings of satisfaction. No participant who delivered at home reported a negative experience as their birth attendant (called grandmother or mamie) addressed their psychosocial needs. Participants reported that the

mamies gave them encouragement, they told them that they will go through it and interacted with them patiently.

## **Discussion and Conclusion**

This paper began by highlighting that maternal mortality is a big issue in sub Saharan Africa. According to the WHO, family planning, prenatal care, skilled birth attendance and emergency obstetrics have been identified as the four most critical interventions in efforts to reduce maternal mortality in developing countries (WHO, 2005). The presence of a skilled attendant during the labor and delivery, which is when most maternal deaths occur, is shown to lead to a marked reduction in maternal mortality (Campbell et al., 2006). Yet, many women (57%) in low-income countries deliver at home without skilled help (WHO, 2010). In order to know why women deliver at home we need to identify the factors that lead to delivering at home and understand how women define and seek out satisfactory birthing experiences, and how those efforts, in turn, bear on their decisions about where to give birth—at home or in a facility. A review of the literature led me to hypothesize that poverty, rural location and number of antenatal visits will be factors that affect the choice to deliver at home. I also hypothesized that birth experiences both positive and negative are important factors to understand choice of place of delivery. The psychosocial elements of labor and delivery are central to any woman's birth experience, but international efforts to reduce maternal mortality in low-income contexts have neglected these aspects and focused on technological birth. There is increasing attention and wider recognition that many women are deterred from facility-based delivery because the intrapartum care on offer does not satisfy the interpersonal and emotional aspects of this biosocial event.

In this paper, I use Demographic Health Survey (DHS) database to analyze responses for over 16,000 respondents in Sierra Leone. The first portion of study sought to assess whether being poor will mean the more likely a woman is to deliver at home, controlling for factors such as number of antenatal visits, distance and geographic accessibility. I hypothesize that the more antenatal visits one has the more likely they are to deliver outside of the home regardless of rural location or if the person considers themselves poor. The rural location also increases the likelihood for delivery to happen at home. Based on the results of the regression, we find support for the hypothesis that being poor does have an effect in the likelihood of someone delivering at home. The more antenatal visits the less likely women are to give birth at home. That is for every additional antenatal visit the less likely it is for delivery to take place at home. If the geography is rural, it is also more likely for delivery to happen at home. From our cohort, psychosocial needs outweighed the physical structure and amenities of a facility. No participant who delivered at home reported a negative experience as their birth attendant (called grandmother or mamie) addressed their psychosocial needs. Participants reported that the mamies gave them encouragement, they told them that they will go through it and interacted with them patiently. Pain management was mentioned by a few participants, but majority of the satisfaction ratings reflected psychosocial factors. Women were more concerned about the encouragement they received, support and communication with the skilled health worker.

The use of primary and secondary data provided large and small background context for analysis. However, it created a limitation as it is unclear whether the data collected on DHS was during the same time period i.e. were reports of place of delivery of most recent child or first child. Having a variable that indicated why participants delivered at home or in facilities would have been a good way to compare data. However, access to information that pertained details

about the specific questions asked for the variables utilized was unavailable as this is secondary data. For the wealth index, it is not clear how respondents categorized their poverty level; based on national finances or self-perception of wealth. These findings emphasize that psychosocial needs should be factored into addressing the challenges in tackling maternal mortality rates in Sierra Leone. Though there is value in the quantity of participants in the small data set, having as many participants as the DHS database would have enabled us to make a more generalizable observation. It would also strengthen our findings and possibly highlighted other factors needed to be considered in exploring long term utilization of facilities during birthing.

As mentioned above, it is clear that getting deliveries to occur in facilities is an important direction in tackling maternal mortality and since research needs to be context specific, the primary data collected in Sierra Leone provides additional perspective on why so many women decide to give birth at home. Satisfaction with a facilities caregiving is important to understand why mothers do not go to facilities and a possible area of intervention. If mothers are dissatisfied with the quality of care, they are less likely to return to a facility. The findings show that participants in the second section of the research experienced both positive and negative experiences. The negative experiences included general discomfort and outright traumatic experiences. It is worth noting that despite variations in experiences, no participant mentioned their dissatisfaction in relation to the physical structures or physical medical interventions present during delivery. There was no mention of the comfort of the bed, the presence or the lack thereof of electricity, water, medical tools, and cleanliness of facility or other amenities. Women were more concerned about the encouragement they received, support and communication with the skilled health worker. Reports of negative experience especially traumatic ones involved nurses calling patients names (e.g., “witch”), being rude and neglect of total care during labor.



The results have highlighted that there are in factors that are important in addressing the use of facilities for delivery as a means of tackling maternal mortality. However, if women are to deliver in facilities, efforts need to align with increasing patients' satisfaction.

Shiferaw et al. (2012) highlighted the importance of context-specific research when exploring reasons behind utilization or non-utilization of health facilities. These are important in reducing maternal mortality rates in Sierra Leone. In order to make an impact, the government needs to also channel interventions in rural and poor communities to increase safe delivery at home or access to health facilities for communities. From this study, it is clear that having more antenatal visits will increase the likelihood for delivery to take place in a health facility

If increase facility delivery will be too much of a push then they can also look at having home delivery monitored by skilled birth attendants, midwives and obstetrics nurses. In this way, parturient would have their psychosocial needs met and medically monitored during the delivery. These health personnel can be taken from the communities. They can be trained and serve their communities. This option will not solve the entire issue of maternal mortality but as studies conducted before the introduction of FHCI in Sierra Leone found, barriers to accessing care at health facilities included prohibitive and unreliable costs, geographic inaccessibility, distance, lack of transport, and lack of supplies and human resources (Herschderfer et al. 2012) are the leading causes for the lack of use of health facilities for delivery. We have also seen that psychosocial satisfaction during delivery is important in birthing. Policies need to be directed in ensuring that mothers experiences during birthing are positive in order to increase the likelihood of future deliveries to occur in a facility. We know that childbirth is a tedious event on its own, so it is important that healthcare facilities make the process bearable. It has been shown that satisfaction with childbirth has immediate and long-term effects on women's health and quality

of their relationship with their child (Jafari et al 2017). Mothers with pleasant childbirth experience have greater self-esteem, stronger relationship with their child, and positive expectations of their future childbirths. In contrast, dissatisfaction with childbirth leads to greater likelihood of postpartum depression, anxiety, posttraumatic stress disorder, impaired mother-infant bonding, fear of the next childbirth, and choice of future caesarean section (Jafari et al 2017).

For future directions, it would be worth exploring if tribe or ethnic identity has an effect on delivery at home. It would also be valuable to get data from the health workers perspective what they need in terms of providing care. The satisfaction from the delivery end of care is also important in ensuring that optimum care is given to parturient. Progress will continue to occur in terms of maternal healthcare when more integrated and coordinated interventions are made.

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## **Exhibit 1**

Survey Welcome:

By completing this survey, you will be participating in research conducted by Lydia Bernard-Jones, a student at Skidmore College. You are affirming that you are at least 18 years of age. This research involves no more than minimal risk. You will be asked a series of questions about your experience of delivering your child, which we ask that you answer to the best of your knowledge. You may skip any questions or stop participating at any time. By completing this survey, you will receive \$3 (approximately 21,000 Sierra Leonean Leones).

In any sort of report that is published or presentation that is given, we will not include any information that will make it possible to identify a participant, and any data from this study that is released will not contain identifiable information. Should you wish to get in contact with the investigator, please contact Lydia Bernard-Jones at lbernar1@skidmore.edu. You may also contact her faculty advisor, Jen McDonald jmcdonal@skidmore.edu or you may contact Mary Hoehn, IRB Chair, at mhoehn@skidmore.edu.

The researchers have taken all reasonable measures to protect your identity and responses. All data will be reported in aggregate. The data are SSL (Secure Socket Layer) encrypted and are stored on a password protected database or on a password protected tablet. IP addresses are not collected. These measures provide the very high level of security that is used by financial institutions, and it is very unlikely that your data could be accessed by anyone. However, e-mail and the Internet are not 100% secure. Therefore, I will clear my cache after every response by participants after filling the survey on your behalf.

I am 18 years of age and consent to participating in this research. \_\_\_\_\_

I am not 18 years of age and I do not consent to participating in this research \_\_\_\_\_

Questions:

1 How many children have you delivered?

2 How old are your children?

3 Of these children,

a. How many did you deliver at home?

b. How many did you deliver in a facility?

4 Why did you choose facility or home delivery for x number of children?

5 Who was present in the room during your delivery of x children? (i.e. family)

6 Did you have any medical personnel present? If yes, who?

7 How would you rate the impact of the presence of health personnel during delivery?

Very negative very positive

1 2 3 4 5

Why?

8 If you answered No to Q6, what was the role of the people present in the room during delivery?

9 Did you go to any prenatal care visits or to a health agent during pregnancy?

10 If you answered Yes to Question 9, what was the advice in terms of what actual delivery would be like?

11 If you answered No to Question 9, how did you know the things you do about delivery?

12 Describe your experience during delivery, including interactions with everyone who was present.

13 After x was born, did you see and/or hold the baby immediately?

14 How would you rate your delivery experience for x baby?

Very Poor Very good

1 2 3 4 5

Why?

15 What financial bracket does your family identify in?

< \$65/month \$66 - \$132/month \$133-\$394/month. \$395-\$658/month > \$659month

16 Are you the only partner/wife of your partner/husband?

17 What's your hometown/city?

18 What tribe/ethnic group do you identify with?

19 What is your age?

20 If someone were to ask you where they should deliver, where would you suggest - home or facility? Why?