

The Pennsylvania State University
The Graduate School

**“ZERO IS NOT GOOD FOR ME”:
MEASUREMENT AND CONSEQUENCES OF INFERTILITY IN
GHANA**

A Dissertation in
Sociology and Demography
by
Jasmine Fledderjohann

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The dissertation of Jasmine Fledderjohann was reviewed and approved* by the following:

David Johnson
Professor of Sociology and Demography
Dissertation Advisor, Chair of Committee

Francis Dodoo
Professor of Sociology and Demography

Leif Jensen
Professor of Rural Sociology and Demography

Jenny Trinitapoli
Assistant Professor of Sociology and Demography

Alan Booth
Professor of Sociology and Demography

John Iceland
Professor of Sociology and Demography
Head of the Department of Sociology

*Signatures are on file in the Graduate School.

Abstract

The measurement and consequences of infertility in sub-Saharan Africa (SSA) is an important but under-explored field of research. Given the high value placed on children in SSA, infertility increases the risk of psychological distress and marital conflict, encourages risky sexual behavior, and deprives infertile individuals and couples of an important source of economic and social capital. The following chapters explore the implications and measurement of infertility in Ghana, West Africa.

I begin with an analysis of qualitative data I collected in Accra, Ghana, in 2008. This chapter examines the effect of infertility on mental well-being and physical health from the perspective of infertile women seeking treatment in a clinical setting. Additionally, I explore the social consequences of infertility and gendered nature of these experiences from the perspective of both fertile and infertile women. I find that infertility has important consequences for each of the aspects of women's lives, and that these consequences are not perceived to be shared equally by Ghanaian men.

Next, using 8 waves of panel data collected by the Population Council of New York and the University of Cape Coast, I consider the optimal measure of infertility for social research in sub-Saharan Africa. Though current infertility research in the SSA suggests a conservative demographic measure is ideal for measuring prevalence, the dearth of self-identified infertility measures in survey data in the region has prevented comparisons. Arguably, however, women's perceptions of their own infertility status may have a greater impact for social outcomes such as marital instability and mental health. Using the Cape Coast data set, I assess the stability of several measures of infertility currently used in the demographic and biomedical literature through the application of a test-retest statistical method. In addition, I examine the correlation between biomedical, demographic, and self-identified infertility, and apply random effects models to explore how each measure relates to

background demographic characteristics.

The final piece of the dissertation empirically examines the relationship between infertility and union instability using discrete-time hazard models. Previous (primarily qualitative) research in the sub-continent has suggested that there may be a link between infertility a divorce; less is known about the implications of infertility for unmarried couples. I explore this relationship both for marriages and non-marital sexual unions.

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Dedication

For the women in the waiting rooms of Accra, who feel their voices are not heard.

Chapter 1

Introduction

Fertility patterns in Sub-Saharan Africa (SSA) have long been of interest to demographers in light of high fertility rates and slow transitions observed in the region. More recently, infertility—used here to mean the inability to achieve (additional) desired births—has gained increasing attention in the sociological, psychological, and demographic literature. While demographic studies tend to focus on measurement and prevalence (see, for example, Larsen 2005), other research points to the social and psychological consequences of infertility for couples (and particularly for women) in SSA (see Dyer 2007; Mogobe 2005). The current study explores the measurement and consequences of infertility in Ghana. I begin with a brief discussion of contemporary Ghana, with focus primarily on factors expected to have an influence on fertility and infertility. In their seminal work on the determinants of fertility in SSA, Bongaarts, Frank, and Lesthaeghe (1984) point to a variety of distal factors, such as socioeconomic and background characteristics, and proximate determinants, such as marriage patterns, contraceptive use, and natural sterility.

1.1 Contemporary Ghana

Located on the coast of West Africa, Ghana is the second largest country in the region—as of 2011, the total population is estimated to be 24,791,000 (Census Bureau 2011). About 50% of the population lives in urban areas, and the growth rate of the urban population was 4.5% between 1990 and 2000 (Unicef 2011). The

country is quite young: over 50% of the population is under the age of 25, while only about 3% is over the age of 65 (Census Bureau 2011).

As a former British colony, Ghana is largely English-speaking; in 1957, Ghana gained independence, becoming the first colonial government to do so (Central Intelligence Agency 2011). The largest ethnic groups in the country include Akan (45.3%), Mole-Dagbon (15.2%), Ewe (11.7%), and Ga-Dangme (7.3%). Nearly 70% of Ghanaians identify themselves as Christians (Pentecostal/Charismatic 24.1%; Protestant 18.6%; Catholic 15.1%). About 16% identify as Muslim, 8.5% follow traditional religions. Less than 1% practice another religion, while just over 6% identify with no religion.

More than half of the labor force is involved in agricultural production, and a primary export is cocoa (CIA 2011). An additional 15% of laborers are employed in industry, and 29% work in the service sector. As of 2008, 78% of men and 52% of women over the age of 15 were actively participating in the labor market (World Bank 2011). Poverty is high, but on the decline—while the percent of the population in poverty was 50% in 1992, it dropped to 39.5% in 1999, and was 28.5% in 2006.

Ghana is in the midst of several important social transitions, including technology, education, and health transitions. For example, a large portion of the population currently uses mobile telephones: as of 2009, there were 15.109 million cellular telephone users (CIA 2011). A much smaller group (though not unsubstantial) uses the internet. In 2009, there were 1.297 million internet users. However, less than 1 in 100 Ghanaians own personal computers (Rural Poverty Portal 2011).

The number of women who have never attended school has declined from just under 40% in 1988 to 21.2% in 2008 (Demographic and Health Surveys 2011). Between 2005 and 2009, about 77% of individuals had attended at least primary school, and 42% also attended secondary school (Unicef 2011). These figures represent an upward trend in education overall: in 1988, 52.8% of adults had attended only primary school, while only 7.5% had attended secondary school; in 2008, 20.1% went to primary school, and a majority (58.6%) had gone to secondary school (DHS 2011). In addition, 66% of adults were literate (Unicef 2011). There is a gender imbalance in literacy, however: for every 100 literate men, only 82 women are literate.

Both maternal and child health have seen marked improvements in the same period. For example, Unicef (2011) puts the 2008 lifetime risk of maternal mortality at 1 in 66; the maternal mortality rate was 350 deaths per 1,000 births. Infant and child mortality has been on the decline: between 1988 and 2008 infant mortality dropped from 77.2 deaths per 1,000 live births to 50.3 deaths (DHS 2011). Concomitantly, mortality in children under the age of five has dropped from 154.7 deaths per 1,000 live births to 80 deaths; in 2009, there were approximately 766,000 live births, while there were 50,000 deaths among children under five years of age (Unicef 2011).

Between 1970 and 2009, life expectancy has increased from 49 years to 57 years (Unicef 2011). In 2008, a surprising 82% of the population had access to improved drinking water resources. However, there was a rural/urban divide in this figure: 90% of urban dwellers and 74% of rural dwellers had access to improved drinking water.

HIV prevalence is low in Ghana in comparison to other countries in the sub-continent. In 2009, 260,000 were estimated to be living with HIV (Unicef 2011). Among these, 140,000 were women over the age of 15—that is, women potentially at risk of mother-to-child transmission. Additionally, there are 160,00 AIDS orphans living in Ghana.

1.2 Childbearing in Ghana

In addition to the social transitions discussed above, Ghana is also undergoing a fertility transition. The Demographic Health Surveys for Ghana show a marked decline in the total fertility rate (TFR) between 1988, when the TFR was 6.4 children per woman, and 2008, with a TFR of 4.0 (Demographic Health Surveys 2011). During the same period, fertility desires have been on the decline: among married women, the number who report wanting no additional children has increased from 23.1% to 36.5%. Meanwhile, reported ideal family size has declined from 5.3 children to 4.3 children.

Interestingly, there have been some changes in marital status over the last two decades. In 1988, among women aged 15 to 49, well over half (64.8%) were married (DHS 2011). This figure dropped to 51.9% in 1998, and 45.4% in 2008. Divorce

has also dropped over the same period, from 5.6% to 4.6% in 1998, and down to 3.2% in 2008. Meanwhile, the number never married and cohabiting has been on the rise. In 1988, the number never married was 19.8%. This figure rose to 23.7% in 1998, and 32.4% in 2008. Cohabitation also increased over this period, from 5.5% in 1988 to 12.7% in 1998 and, finally, to 13.1% in 2008.

The median age of first marriage and first intercourse have both been on the rise between 1988 and 2008: age at marriage has risen from 12.9 to 23.5 years, while age at first intercourse has risen from 16.5 to 18.4 (DHS 2011). Contraceptive use among married women has also increased during this time frame—from 12.9% to 23.5% for all methods, and from 4.2% to 16.6% for modern methods. Of the women who do carry a pregnancy to term, 57% have a skilled delivery attendant available when they deliver (Unicef 2011).

While the majority of births still occur within the context of marriage in SSA, a substantial minority of births take place outside of marital unions (Zabin and Kiragu 1998). As Meekers (1994) points out, age at first marriage is the strongest determinant of premarital childbearing; as the age of sexual maturation has declined and age at first marriage has been on the rise, premarital teen births are on the rise in Ghana (Moreland and Logan 2000). However, extramarital childbearing is not restricted to teen births. Infertility plays a key role in non-marital births in SSA; when a couple has difficulties achieving a desired pregnancy, a sexual partnership may be sought outside of the marital union (Bledsoe 2002; Mgalla and Boerma 2001). If this outside partnership results in a pregnancy, there is generally a gender difference in the response: if a woman obtains an outside pregnancy, she is likely to pass this pregnancy off as conceived within the marriage; if a man's outside partner becomes pregnant, he may opt to continue the outside partnership, divorce his wife and marry the pregnant partner, or take the pregnant partner as an additional wife (Barden-O'Fallon 2005; Mgalla and Boerma 2001).

1.3 Infertility in Sub-Saharan Africa

Broadly speaking, infertility may be conceptualized as the physical inability of a non-contracepting couple to achieve desired family size. While it is true that couples who do not desire to have (additional) children may experience some under-

lying subfecundity, Greil and McQuillan (2004) find that women who are infertile with intent are more inclined to seek treatment, and may experience social and psychological consequences of infertility to a greater extent. In other words, while capturing infertility without intent may be important for estimating biological prevalence, infertility with intent is likely to be more salient for social outcomes.

Definitions of infertility vary somewhat between the biomedical literature and the demographic literature: while biomedical definitions focus on the inability to conceive, demographic definitions tend to focus the inability to achieve live births (Larsen 2005). Definitions also vary based on how long a couple must try to conceive or to achieve a live birth. An additional distinction may be made between primary and secondary infertility: primary infertility is childlessness, whereas secondary infertility is infertility which occurs subsequent to the live birth of at least one child.

Across the subcontinent, data from the Demographic and Health Surveys suggest that primary infertility ranges between 3% and 5%, which is on par with naturally occurring global averages (Larsen 1994). In Ghana, primary infertility is at about 2% in Ghana (Larsen 2000). Secondary infertility, however, is comparatively high—around 15-16% in Ghana, and between 5% (Togo) and 23% (Central African Republic) in SSA more broadly. The aforementioned frequency of outside partnerships contributes to the spread of sexually transmitted infections (STIs). In combination with unsafe birthing practices resulting in postpartum infections, STIs increase risk of pelvic inflammatory disease (PID), which is largely responsible for the high rates of secondary infertility in SSA.

1.4 Significance of the Study

The above suggests that social and demographic trends are creating substantial change in Ghana. These changes are likely to have important effects on the prevalence, treatment, and social response to infertility in Ghana. For instance, as technology advances—particularly medical technology—western treatments for infertility will become increasingly available. While this may enable subfecund couples to overcome difficulties conceiving, it may also place increasing pressure on couples who struggle to conceive as they may be expected to seek treatment in response

to infertility.

The fertility transition in Ghana may likewise have important implications for infertility. For instance, as couples desire fewer children and family sizes decline, social pressure for childbearing may be reduced. Moreover, women who may otherwise have been identified as infertile may no longer be considered infertile when family size declines; a woman who does not desire to have any additional children is unlikely to identify herself as infertile. She may be more inclined to use contraceptives or practice abstinence to prevent unplanned pregnancy; by most measures, contraceptive use (and by many, abstinence) will remove women from the risk pool for infertility; thus, likelihood of being identified as infertile by objective measures may also be reduced as fertility desires and family size decline.

Moreover, Frank (1983) contends that high rates of infertility are likely to increase fertility rates in SSA due to the high value placed on children. She notes that women in SSA express a desire to control their fertility, but also report fear of infertility; thus, women may rush fertility or have more children than ultimately desired in order to ensure adequate family size and child survival before infertility becomes a problem. Frank concludes that although a decline in secondary infertility may initially result in an increase in the fertility rate, once a the decline in infertility has been noted on a local level, fertility rates will begin to decline, resulting in a net decrease in fertility in the long run—an argument which closely parallels the theorized linkage between fertility and mortality decline in the demographic transition literature (see Kirk for a full description of the demographic transition).

The title quote, “Zero is not good for me,” is from an interview I conducted with a Ghanaian woman regarding her difficulties conceiving. I selected this quote because it succinctly summarizes the negative effect infertility has on well-being for Ghanaian women. Sundby (2002) points out that, while infertility has been overshadowed by studies of high fertility, infertility deserves greater attention as a serious public health concern. This insight is particularly relevant in light of the link between infertility and STI’s—particularly HIV, though this link remains under explored (Okonofua 1999). Beyond being a public health concern, infertility also has serious psychosocial consequences. For example, previous research has suggested that infertile women in SSA face ostracism, marital discord and disruption,

disinheritance, and even domestic violence (Okonofua 1999; Sundby and Jacobus 2001; Leonard 2002).

The current study corroborates many of the findings from previous research, stressing the importance of infertility not only as a narrowly defined reproductive health issue, but as a broader health problem with serious social consequences. In addition to confirming findings from previous research, the current study makes several unique contributions. First, I explore the relationship between infertility and physical health. Second, I analyze the utility of demographic and biomedical measures of infertility for examining social outcomes; previous work exploring measurement has focused primarily on estimating prevalence. Third, while some prior research has suggested a relationship between infertility and marital instability, there does not appear to be much quantitative evidence—particularly in West Africa—on the likelihood of relationship instability in the subcontinent; evidence regarding cohabitation is even more elusive. This study provides a quantitative analysis of the impact of infertility on relationship instability for both married and unmarried women in sexual unions. Finally, much of the previous research on the consequences of infertility focuses on South and Central Africa; I extend previous findings to West Africa.

1.5 Organization of the Dissertation

The following chapters explore the measurement and social consequences of infertility in Ghana. In Chapter 2, I explore the social consequences of infertility using qualitative methods. Previous research in SSA has linked infertility—particularly childlessness—to psychological distress, domestic violence, increased risk of divorce, and strained social interactions, such as exclusion from community decisions and stigmatization. I apply grounded theory to semi-structured interview data I collected in Accra, Ghana, in the fall of 2008. Findings from Chapter 2 support previous findings regarding the deleterious effects of infertility for marital quality and stability, mental health, and social interactions. Both infertile women and those seeking obstetric care also cited gender differences in the consequences of infertility. In addition, I find some evidence that infertile women believe their infertility has a negative impact on their physical health.

In Chapter 3, I examine a variety of measures of infertility including biomedical, demographic, and self-identified measures. While previous research has examined the utility of several measures for estimating prevalence or ensuring early treatment of infertility, little is known about the utility of these measures for exploring the relationship between infertility and social outcomes. Data for this analysis come from 8 waves of panel data collected by the Population Council and the University of Cape Coast. I begin with correlations within measures across waves and between measures. Next, I apply a test-retest model for categorical outcomes to assess the stability of measures. Finally, I complete a series of random effects models to examine how the measures relate to background characteristics. I find that demographic measures of infertility are, on the whole, quite stable, but are neither the most appropriate measure of underlying latent infertility, nor are they closely correlated with self-identified infertility. I contend that clinical, epidemiological, and self-identified measures of infertility are more appropriate for social research in SSA, though demographic measures are likely more appropriate for estimating prevalence.

Chapter 4 explores the relationship between infertility and marital instability. Extant research suggests that infertile married couples face increased conflict, divorce, and even domestic violence. However, most of the research on the topic in SSA is based on small clinical samples; quantitative studies of the subject are limited. Even less is known about the effects of infertility among couples who are involved in a sexual union but are not married. Using the aforementioned Cape Coast panel data, I apply discrete-time hazard models to examine the relationship between infertility and relationship instability for both married and unmarried couples. I find that infertility is significantly, positively associated with relationship disruption. Moreover, self-identified infertility appears to be significant even when controlling for a more traditionally objective measure, suggesting that the perception of infertility may, in fact, be more salient for predicting relationship disruption than is underlying biological subfecundity.

Finally, Chapter 5 provides a synthesis of the findings presented in Chapters 2 through 4. In addition, I explore the implications of the findings of the current study, including policy implications.

‘It’s Always the Woman’s Fault’: An Exploration of the Implications of Infertility in Ghana

2.1 Introduction

Fertility and family formation patterns in sub-Saharan Africa (SSA) have long been of interest to sociologists and demographers, as evidenced by the vast body of literature on the causes and consequences of high fertility in this region (see, for example, Bongaarts et al. 1984; Caldwell, Orubuloye et al. 1992; Bongaarts and Watkins 1996; Brockerhoff 2008). Focus has been placed primarily on understanding patterns of fertility, with emphasis on what motivates fertility decisions. This line of research establishes childbearing as crucial part to obtaining adult status, attaining emotional fulfillment, and securing socioeconomic stability in SSA (Kirk 1996). Previous research has documented the deleterious effects of infertility—the inability to have (additional) desired children—on social networks, marital stability, economic well-being, and mental health (Dyer 2007). Some researchers go so far as to suggest that childbearing is the central defining component of adult life in SSA (Geelhoed 2002).

In light of the importance placed on childbearing in this pronatalist context, it follows that there would be substantial social repercussions for infertility; yet

the social impact of infertility in SSA remains an underexplored area of research. Given the strong emphasis placed on limiting fertility to curb population growth (Richards 2002; Sundby and Jacobus 2001), public health policy in the region has largely failed to address the needs of infertile couples. Moreover, infertility is largely treated as a narrowly defined reproductive health issue in the literature on family formation in SSA (Sundby 2002). However, a richer and more nuanced understanding of the lived experiences of infertile women is likely to reveal far-reaching consequences beyond the realm of reproductive health.

The limited research that does focus on infertility in SSA is overwhelmingly drawn from samples in South and Central Africa, with less attention paid to infertility in West Africa. Given the social and economic differences between these regions (Turner 2006), there is an impetus to explore further the implications of infertility in West Africa. Additionally, the extent to which other (non-infertile) community members corroborate the experiences reported by infertile women is unclear. Yet such an understanding may serve to validate findings from clinical settings. Finally, while extant research in SSA and the U.S. explores the mental health consequences of infertility (Greil 1997; Dyer et al. 2007), there is a dearth of research examining the relationship between infertility and physical health. Relying on semi-structured interview data from a clinical sample, the current study explores the implications of infertility for Ghanaian women.

2.2 Literature Review

2.2.1 *Infertility and Mental Health*

Research on infertility in the U.S. catalogs the relationship between infertility and distress—both fertility-specific distress and global distress. In general, these studies find infertility to be distressing to both males and females, though most studies find that women are more distressed than their male partners (see, for example, Greil 1997; Wright et al. 1991; Clarke, Martin-Matthews, and Matthews 2006). Some studies attribute the distress associated with infertility to pressures imposed by a pronatalist paradigm in U.S., which depicts motherhood as a master status for women (Parry 2005; Mueller and Yoder 1999).

A growing body of research has established that psychological stressors are a common consequence of infertility in SSA as well (Dyer 2007; Dyer et al. 2007; Dyer, Abrahams, Hoffman, and van der Spuy 2007) . Dyer et al. (2007) report that, compared to fertile women, infertile women suffer from greater psychological distress, both in terms of width and depth. In comparing distress among Nigerian women with primary (childlessness) versus secondary (infertility subsequent to at least one birth) infertility, Upkong and Orji (2006) find that depression is greater among women who have had no children, as compared to those who have had at least one child.

Moreover, some research based on psychological distress instruments has shown that both men and women suffer from high levels of psychological distress related to their infertility-that is, the presence of high levels of fertility-specific distress is not a uniquely female phenomenon (Dyer 2007). As in the US, however, infertile African women tend to have significantly higher levels of distress than their male counterparts. Coping strategies are often developed as a means of dealing with the high psychological distress caused, in part, by the social exclusion they experience because of their infertility.

Overall, the literature suggests that infertile women are more likely than those who do not experience difficulties achieving desired family size to suffer from psychological distress. Moreover, this experience appears to be gendered, so that women experience distress to a greater degree than do their male partners. This psychological distress is, in turn, likely to be related to other important predictors of well-being, such as marital quality and social network support.

2.2.2 Infertility and Marriage

There is strong evidence that infertility leads to increased marital instability (Dyer, Abrahams, Hoffman, and Spuy 2007); infertile women in Tanzania, for example, cite divorce, disinheritance, and poor relations with their in-laws as consequences of infertility (Mgalla and Boerma 2001). In some cases, infertile women may face physical abuse by both the husband and the in-laws (Dyer et al. 2004; McCloskey et al. 2005). Sundby and Jacobus (2001) outline the interconnected processes by which infertility subjects women to marital instability and dissolution,

reduces the social status and mental health, and subjects them to disinheritance. While males may easily leave infertile women, women often opt not to leave in the case of infertility, citing inability to repay the bridewealth, family shame, religious reasons, and male control over decision making as motivations for remaining with infertile partners. Okonofua (1999) concludes that infertility strongly contributes to marital disharmony and exposes women to physical violence, ostracism, and discrimination.

Research on infertility in the U.S. has shown that fertility-specific distress may be not only a consequence, but also a cause of marital discord. Andrews, Abbey, and Halman (1991), for example, find that stress related to fertility difficulties contributes to marital conflict, and it appears to contribute to lower ratings of intimacy, marriage, and life more broadly. Research in SSA has similarly suggested that strained marital relations may be one factor contributing to the diminished mental health of infertile women. Infertility has been shown to increase psychiatric morbidity, reduce positive perceptions of the marital relationship, increase marital conflict, and reduce coital frequency and sexual satisfaction (Upkong and Orji 2006).

There is also substantial evidence that extramarital sexual activity is not uncommon, due in part to long periods of post-partum abstinence which are typical in much of SSA; some women may opt to break cultural taboos and engage in intercourse due to fear that their husbands may seek other partners (Drees du Lou 1999). Extramarital sexual activity, in combination with polygynous marriage, declining age at first intercourse, and a rising age at first marriage, is, in turn, associated with an increased risk of sexually transmitted infections (STI's). A strong link also exists between sexually transmitted infections and reproductive tract infections (RTI's), which are estimated to be responsible for between 50% and 80% of infertility in SSA (Boerma and Urassa 2001; Mayaud 2001; White et al. 2001). However, when infertility is suspected, extramarital relationships to "test" one's fertility with another partner are often encouraged for the male partner; this increases the risk of RTI's and, in turn, infertility, further compounding the problem (Lunenfeld and van Steirteghem 2004). Women may also seek a pregnancy outside of the union, though this is much more likely to be done in secret (Mgalla and Boerma 2001).

Overall, then, infertility appears to expose women to marital discord, domestic abuse, infidelity, and marital instability, including divorce.

2.2.3 *Infertility and Social Interactions*

Social status in SSA is closely tied to childbearing, with higher status associated with the birth of a male child in many regions (Dyer 2007); infertility strongly impacts one's adult status and standing within the community. Women are taught from childhood that womanhood is tied to motherhood; when women cannot speak of their own experiences of pregnancy, labor, delivery, and parenting, they are often excluded from adult conversations which center on these topics (Mogobe 2005). Couples often experience pressure from spouses, family members, friends, and community members to obtain a quick pregnancy after marriage; when infertility is suspected, men are publicly humiliated, and women are blamed for failure to achieve a pregnancy (Barden-O'Fallon 2005).

Among the Yoruba of West Africa, for example, infertility is characterized as both a personal and a public issue (Pearce 1999). Infertile men and women may be barred from participation in important community discussions and decisions due to their inexperience with childbearing and rearing (Dyer 2007). Similarly, Mogobe (2005) finds that infertile women report exclusion from discussions of pregnancy, labor, and delivery. In addition, infertile women speak of having "no child to send," meaning that they have not had a child of their own who they can rely on to run errands (Dyer 2007; Gijssels, Mgalla, and Wambura 2001). Having no child to send has a negative effect on socioeconomic status, as the woman's economic efficiency is reduced by her need to conduct menial labor herself; nor can she rely on her children to generate surplus which can be exchanged in the informal economy to strengthen social ties which can be relied upon in times of need. Even more fundamentally, a woman who has no child to send is viewed as having no place in society.

Infertility is often attributed to abortion, witchcraft, physical abnormalities with spiritual origins, sexual promiscuity, and, sometimes, the use of modern contraceptives (Allen 2001; Mgalla and Boerma 2001; Pool and Washija 2001). Given the negative connotation associated with these factors, such attributions often lead

to considerable social stigma. This stigmatization includes vulnerability to name calling, insults, and social isolation. One woman, in reference to a commonly used derogatory name (“Failure,” in English) for an infertile person, said: “Stjoekoe, they throw it at me... I feel [like] junk. That is why I don’t have no friends” (Dyer, Abrahams, Hoffman, and van der Spuy 2002; p. 1665). Infertile women also cite family members as a source of pressure and shame, although there were a few exceptions in which family members provided emotional support.

2.2.4 *Infertility and Gender*

For both men and women, having a child is an important marker of adult gender identification (Dyer 2007). Infertile men and women are found to experience higher levels of psychological distress than fertile couples; however, stress levels are particularly high for infertile women (Dyer et al. 2005). Dyer and colleagues hypothesize that this gender differential may stem from the fact that women are often blamed for couple infertility, leading to harsher social consequences than those faced by men. Additionally, infertile women in the study appear to be frequent victims of domestic violence, from both male partners and in-laws.

Husbands are often unwilling to participate in testing procedures, making the source of infertility difficult to pinpoint (Sundby and Jacobus 2001). Furthermore, women recognize their role in shouldering the blame; although male infertility is acknowledged to exist, women ultimately report that they are ultimately held responsible for the couple’s infertility (Mgalla and Boerma 2001). Rarely will a woman attempt to deflect insults by spouses who suggest that they might be responsible for the infertility (Mogobe 2005). There also appears to be a gender disparity in the solutions to infertility: while outside partnerships and, eventually, polygyny or divorce are sought in the case of an infertile female partner, the family of an infertile man may secretly arrange for another male partner to impregnate the wife in order to spare the infertile husband stigma and embarrassment (Gijssels et al. 2001).

In spite of widespread acknowledgement that a couple’s inability to conceive may be caused either by the man or the woman, there is a strong tendency for the men to blame women for couple infertility, expressing beliefs that, although

some men may hypothetically be infertile, their own susceptibility to infertility is not plausible (Dyer, Abrahams, Mokoena, and Spuy 2004). The men appear to recognize that the social and emotional strain that they feel regarding their couple infertility is likely substantially magnified for women. Relationships with family and community members seem to be mixed, with some men citing pressure from these sources and other men acknowledging family and friends as sources of social support.

Summary in Brief

Existing research on infertility in SSA suggests that it has important implications for mental health and well-being, marital quality and stability, and social network interactions. Women who identify as infertile report experiencing marital disruption, poverty, abuse, social isolation, changes in sexual partners, and dangerous treatments when seeking help (Leonard 2002). The current study seeks to extend findings from previous studies which a) focus predominately on the consequences of infertility (such as stigmatization or distress) in isolation rather than in tandem, b) draw largely on samples of childless women, with less attention paid to the consequences of secondary infertility, and c) are disproportionately centered on South Africa.

Relying on a sample of 107 Ghanaian women seeking obstetric care or treatment for infertility, this study elucidates the interconnected processes which shape the lived experiences of infertile women in West Africa. This research seeks to address the following questions: What mental health difficulties (if any) do women who self-identify as infertile report? What impact (if any) does infertility have on marital quality and stability? Do infertile women experience strained social interactions with family, friends, and social network members? Is there a relationship between infertility and physical health? Do infertile women perceive gender differences in these experiences? Are the social experiences reported by infertile women validated by other community members?

2.3 Data and Methods

I collected the data for this study in Accra, Ghana during the fall of 2008. Institutional Review Board approval for the data collection was obtained from both The Pennsylvania State University and The University of Ghana. Four local health clinics with an emphasis on gynecology and obstetrics were contacted regarding the study; two clinics agreed to allow sampling within the facilities. A research team composed of the author and four female graduate students from the Regional Institute of Population Studies at the University of Ghana, who had previously trained in social survey administration and fieldwork, spent several days conducting interviews in a private room at each of the clinics.

Semi-structured interviews were administered to all women seeking gynecological or obstetric services in the clinics (response rate was 100%; women were eager to share their experiences), resulting in a total sample size of 107 women. Given that women seeking help at clinics must have both the time (women could expect to spend several hours in the waiting room on any given visit to the clinic) and monetary resources to seek treatment, it is likely that the sample reflects some selection bias and, as a result, women in study are likely to have a higher socioeconomic status on average than the population of Ghanaian women more broadly.

Interviews, which were conducted in English, took approximately half an hour for most women. The instrument included close-ended questions on marital status, birth history, experiences with domestic violence, demographics, general health history, and self-rated health. The instrument also included a number of open-ended questions relating to social network interactions and perceived community responses to infertility. Definitions of infertility were based on self-assessment, as measured by the question “Would you say that it is very difficult, somewhat difficult, or not at all difficult for you to conceive a child?” Women who selected “very difficult” or “somewhat difficult” were defined as infertile; those who selected “not at all difficult” were defined as fecund. This item was drawn from a longitudinal study conducted by the Population Council and the University of Cape Coast (Casterline 2007).

All of the women in the sample were asked how women who were perceived to be infertile were treated by community members, neighbors, and family. In

addition, they were asked how infertile men were treated. Only infertile women were asked to reflect on personal experiences with infertility. Specifically, infertile women were asked whether they felt they had been treated differently, as well as whether their difficulties conceiving had an impact on their health. Responses to open-ended questions were entered into the N6 qualitative data package; responses to closed-ended questions were entered in Stata 10.

This analysis explores the effects of infertility on the lived experiences of infertile women using qualitative methods. I provide basic summary statistics to describe the sample in terms of its demographic characteristics, but focus my analysis on the responses to the open-ended questions.

I coded the qualitative data in three rounds (Miles and Huberman 1994; Strauss 1987): first, an initial reading was completed without attempting to identify thematic material. A second reading suggested a variety of emergent themes, with focus on women's personal reports of the implications of infertility for mental and emotional health, marital relationships, broader social interactions, and gender differences. In addition, data from interviews with women who had no difficulties conceiving were coded as bystander accounts of the effect of infertility on social relationships, as well as of gender differences. A third reading involved coding the data again to ensure consistency within my own coding of the data. Quotations which were particularly illustrative of the thematic material were selected for presentation.

Although no formal hypotheses were tested, several themes based on the literature were explored. The following infertility-related themes guide the analysis to determine whether the data confirm the expectations outlined above: mental health, social interactions, marital instability, and gendered experiences. These themes speak to the research questions outlined above: What mental health difficulties (if any) do women who self-identify as infertile report? What impact (if any) does infertility have on marital quality and stability? Do infertile women experience strained social interactions with family, friends, and social network members? Is there a relationship between infertility and physical health? Do infertile women perceive gender differences in these experiences? Are the social experiences reported by infertile women validated by other community members?

2.4 Results

2.4.1 *Descriptive Statistics*

Descriptive statistics are presented in Table 2.1. The women in the sample were between ages 21 and 48, with a mean age of 33. A majority of the respondents were married, though 12% were either single or in a non-marital sexual union. Most of the women in the study (61%) had no children, though some of them did not find this to be problematic. The maximum number of children reported in the study was 4, placing the mean number of children at under one (.57) per woman on average.

Nearly all of the women had attended school at some point; 16% had attended primary only, 58% had attended secondary school, and 26% had attended a tertiary school. Over 90% of women in the sample were employed outside of the home during the previous year. Self-reported infertility was based on the respondent's rating of difficulty conceiving; women who reported that it was very difficult or somewhat difficult to conceive were classified as infertile, regardless of parity. Parity was used to distinguish primary infertility (infertility among childless women) to secondary infertility (infertility subsequent to the birth of at least one child). Due to the clinical nature of the sampling frame, only 31% of women reported no infertility; 41% of women were infertile and childless (primary infertility), and 26% were infertile after the birth of a child (secondary infertility).

2.4.2 *The Importance of Childbearing*

In order to explore the link between infertility, social relationships, and well-being, an understanding of the importance of childbearing in Ghana is vital. Although women were not explicitly asked to reflect on the importance of childbearing in Ghanaian society, the subject naturally arose when women, both fertile and infertile, were asked about their childbearing preferences. As shown in Table 2.2, the vast majority of both fertile and infertile women (91.5%) wanted between 2 and 4 children; none of the women in the study wanted less than two. Most infertile women wanted between 2 and 3 children, and most fertile women said that they wanted 3. However, women who identified as infertile showed a great deal

Table 2.1. Descriptives

	Mean	St. Dev	Min	Max
Age	32.92	6.03	21	48
Age at First Marriage	26.80	5.03	11	40
<i>Marital Status</i>				
Never	0.05	0.21	0	1
In Union	0.07	0.25	0	1
Married	0.89	0.32	0	1
Parity	0.57	0.85	0	4
<i>Ever Attended School</i>				
Yes	0.95	0.21	0	1
<i>Highest Level of School</i>				
Primary School	0.16	0.36	0	1
Secondary School	0.58	0.50	0	1
Higher than Secondary	0.26	0.44	0	1
<i>Worked in the Past Year</i>				
Yes	0.93	0.25	0	1
<i>Self-Identified Infertility</i>				
No Infertility	0.31	0.46	0	1
Primary Infertility	0.41	0.49	0	1
Secondary Infertility	0.26	0.44	0	1

Note: Proportions do not add up to 100% due to missing data.

more variation in their responses-although they had an ideal number of children in mind, many women seemed happy to accept any number of children they could bear. In response to the question of fertility preferences, a 24 year old woman with no children who identified as infertile said “5 really. Even 10! Because of free education, how many ever I can look after well.” Another infertile respondent with no children, age 41, replied: “Any number God gives me. I am really praying for twins, but even one. In my own strength, I want five. Praying for twins, even triplets! Any number God gives me. But zero is not good for me.”

When discussing their preferences, women often explained their desires in terms of the emotional fulfillment provided by children, as well as of the social support that stems from childbearing. Their comments reflected the belief that a woman with children will receive emotional support and financial assistance in raising the child. In contrast, a childless woman can expect not only to be denied such

Table 2.2. Fertility Preferences

# of Children	Fertile	%	Infertile	%	Total	%
2	8	7.6	16	15.2	24	22.9
3	17	16.2	26	24.8	43	41.0
4	6	5.7	23	21.9	29	27.6
5	0	0.0	4	3.8	4	3.8
6	0	0.0	1	1.0	1	1.0
10	1	1.0	0	0.0	1	1.0
Up to God	0	0.0	1	1.0	1	1.0
Other	0	0.0	2	1.9	2	1.9
Total*	32	30.5	73	69.5	105	100.0

*Does not add to 107 due to missing data.

support, but also to experience stigmatization for her difficulties conceiving. As one respondent put it, “In Ghana, when you don’t have a child you are considered useless if you don’t have children, so you won’t get support. You might be lucky to get support” (Age 32, infertile, 1 child). Another childless infertile woman, age 40, spoke of the importance of children for attaining emotional fulfillment: “I believe that children add a lot to life. When you don’t have a child it means that there is nothing more to your life.” In sum, women in the study universally agreed that childbearing is central to adult life in Ghana, and, given this, inability to bear children is likely to have serious consequences.

2.4.3 *Individual Experiences*

Mental Health

In discussing their personal experiences with infertility, many women in the study raised the issue of mental health difficulties stemming from their difficulties conceiving. Specifically, women spoke to the issue of mental distress in response to the question “Do you think that your difficulties conceiving a child have had an impact on your health?”. Although most of the problems were mild, such as loneliness and worry, some women exhibited symptoms of depression ranging from extended periods spent crying to insomnia:

I've been thinking, I've been crying on this but I believe it. Sometimes 3 days I will cry throughout. [Age 41, infertile, 1 child]

I've been crying always, things people say and what they do. When you go home, you can't even sleep. [Age 35, infertile, childless]

Many mentions were made of time spent contemplating difficulties conceiving. One 24 year old childless respondent said "I worry. It's like working for money but not getting paid. It causes emotional problems." Reports of emotional turmoil were common:

I had a surgery for my fibroid. Emotionally, I am not happy. I'm always sad. My child isn't with me either. Her father took her away from me. I think so much and have high blood pressure. At my house I should have grown kids. It's not easy. [Age 40, infertile, 1 child]

Many women felt that their difficulties conceiving were directly increasing their level of stress, as they spent a significant amount of time thinking about childbearing. When asked if she felt her infertility had an impact on her health, a childless 32 year old woman responded "Yes, because I don't feel happy when I remember that I don't have any child. I don't feel happy at all."

Women reported feeling sad and lonely, but some were also hopeful that they would overcome their difficulties and eventually become pregnant:

It causes me stress. People say things to hurt me. It worries me. But when I have the child, because of the trouble I have gone through, I will really love the child. [Age 28, infertile, 2 children]

One respondent summarized the emotional turmoil associated with her infertility as follows:

It's just like I said before, everyone wants to give you advice, but in the end you are alone in your own little world of infertility, and of course here in Ghana most of the advice is to go to churches, let's go to this church, this pastor is good, he will pray for you. Most, 60% of women would prefer to go to church for infertility. Of course the

personal anxiety the woman goes through is just... it's unbelievable.
There's a lot of anxiety. [Age 37, infertile, childless]

Overall, the most commonly mentioned theme was time spent worrying about difficulties conceiving, followed closely by reports of sadness and loneliness. Related to these problems were high levels of stress, headaches, crying, and insomnia.

Marital Instability

Given the centrality of childbearing to adult married life in Ghana, it is not surprising that infertility may lead to marital instability. As previously noted, the practice of polygyny, though on the decline, is still widely accepted in Ghana; this affords male partners the option of “testing” their fertility with other sexual partners. Although these partnerships may not always lead to an additional marriage, the phenomenon of having children with another partner in the case of infertility was not an uncommon theme.

Several women noted that taking an outside lover is not a practice limited to male partners; however, the nature of these outside partnerships differs for men and women. For men, an outside partnership may lead to an additional marriage, or, at the very least, proof of one's own virility. For women, outside partnerships are secretive, and often serve to save the husband's reputation in the case of male factor infertility. Ultimately, the responsibility for infertility falls to the female partner. As this woman noted, the woman may “go out and get the child for him”:

They always put the pressure on the woman. If you go with your husband to get checked out you cannot come out and say it is your husband. The lady can go out and get the child for him. The mans, they say I am not out. If I ask my husband to come here [to the infertility clinic], he will not come. Towards, the man, there is nothing else. To the close family, the husband's family, they will blame the woman. The woman is not giving him. [Age 41, infertile, 1 child]

A number of women in the study spoke of their fears regarding the potential for marital infidelity, or, in some cases, their husbands' known extramarital unions.

Where infertility can clearly be identified as male factor, divorce may be a viable option; however, if the infertility factor cannot be identified, outside partnerships are common. For many, these outside partnerships are cause for concern, but, for a few, such partnerships serve to deflect marital conflict. In the words of one respondent:

My husband has a girlfriend with one child. Of late, it takes out of my mind, my husband's extramarital affairs. I'm ok. I don't want to think about marital issues. A couple I knew, no kids for 7 years. Everyone blamed the woman. The doctor diagnosed the man as impotent, then they were divorced. The man got laughed at. [Age 42, infertile, 2 children]

Although much rarer, the issue of domestic violence in response to infertility did also arise. In the few instances in which women mentioned being victim to such violence, they were quick to dismiss the violence. When asked if she had ever been hit, slapped, or physically hurt on purpose by her husband, one woman said: "I don't have any problem with anyone apart from the few times when I have some scuffles with my husband, but he actually approaches afterwards" (Age 41, infertile, 4 children). As suggested in the literature, the risk of domestic violence may arise, in part, from pressure from the family-particularly on the husband's side. Indeed, familial pressure to have children was repeatedly cited throughout the course of the study.

Many women also noted that divorce was considered a legitimate option in the case of known infertility, both for male and female partners. However, this insight was tempered by the acknowledgement that male factor infertility is difficult to identify, particularly in light of low rates of male partner testing. A 21 year old childless woman seeking infertility treatment said "My mother was treated differently, before she had me. She went into 3 marriages and divorced because she didn't have any children."

Though less common than themes of mental health, gender differences, and strained social interactions, several women in the study did refer to the relationship between infertility and marital instability. Some cited their own experiences with infidelity in response to infertility; others had divorced and were currently trying to

conceive with a new husband. While a few women stated that their husbands were a source of support, many also acknowledged that outside partnerships, polygyny, or divorce are common responses to infertility.

Social Interactions

Numerous respondents contended that childbearing is at the crux of adult status attainment in Ghana. Women who have difficulties conceiving are often excluded from discussions of child rearing. Moreover, although it is generally acceptable for parents to discipline another person's child when necessary, infertile women and even men are discouraged from disciplining or even interacting with children. Instead, they are harshly told to have children of their own. An infertile, childless 29 year old woman recalled "Even at church, a friend embarrassed my husband because he was playing with her child. She said 'go have your own'".

The issue of authority over children in the community was a common theme. Sending children to run errands is a useful strategy for meeting the many demands on one's time, particularly in light of the heavy workloads faced by many Ghanaian women. Not only do infertile women not have the option of sending their own children on errands, but many of them felt that they were ostracized when they asked another woman's child to run an errand:

They don't treat you well. They keep their children away from you, and if you want to send someone else's child, the mother won't allow it. They'll say send your own child. Also, if you're sick and you can't walk, you'll not get anyone to do it for you. Even fetching water, you can't get anyone to do it for you. [Age 35, infertile, childless]

Many women mentioned that infertile women were purposely excluded from adult conversations pertaining to child rearing due to their infertility. In the words of one respondent:

One was that we were discussing about the way children behave and when the people were giving their experiences as how their children behave at a certain age, with my sister's children, I know how children behave and I was trying to express my opinion and one was like 'you

don't know what we're talking about, so you excuse us.' It was very painful. [Age 33, infertile, childless]

Many women—both those who had children and those who were childless—felt that they were treated differently than fertile women. In particular, they felt that common civility was sometimes not extended to them. When asked if she felt she had ever been treated differently due to her difficulties conceiving, a childless 35 year old respondent replied: “Yes, YES, capital yes! Because we are in a family house, there are other married women in each house who have their own children. The way they talk to her, politely, but to me they talk to me very harsh and in an immoral manner, in a provocative manner.” The most commonly cited reaction to infertility was gossip or verbal assault in the form of mocking or insults:

They tease. Giving you names. Insulting you. They used to carry the babies in front of you [respondent gestured to indicate carrying babies]. Like “Sarah” [Biblical reference] “barren woman”. They say your uterus, your womb is not working. Because I find it difficult to conceive, when we are doing something in the family because I don't have a child won't come to me. They won't come to talk to me and even I can't if their children are around and I want to touch them the way they behave I can't touch them because if I touch them they will insult me. [Age 35, infertile, 4 children]

Sources of these various social stressors include community members, friends, and even family members. Most women spoke of community members gossiping and insulting them; friends were more likely to gossip, and family members often placed pressure on the infertile woman or failed to provide her with support:

They will not have the same. For example, I can't go to my husband's family because they insult me, they laugh at me. If someone is doing something I don't want to go because I am afraid they will laugh at me. In my case, if you're my husband I can't go near them, they say I am wasting their brother's time, so how can I get support? They will say things to make you hang yourself. You can't send someone else's child. They just insult you and laugh at you. I don't share my ideas

with them Our culture, if the woman doesn't give the children for you, the man will just... hm... [Age 41, infertile, 1 child]

Although some women did not feel that a woman with no difficulties conceiving would have more friends than a woman who could not conceive, many women emphasized the difference in the nature of the friendships. For some women, advice for overcoming infertility was the sole foundation of many friendships. For others, friends were sometimes duplicitous, resulting in friends spreading gossip about the woman's difficulties:

To me, I don't make friends because they laugh at you and say things because you don't have a baby. When you take my home, those who have children group together and give you all sorts of names as you pass by to those who don't have children. [Age 32, infertile, childless]

It boils down to what I said earlier-although you might have friends around you, immediately when you turn around they will say things about you. Some people will even ridicule you because of your difficulty to conceive. [Age 37, infertile, 1 child]

Strained social interactions were the most widely discussed topic throughout the course of the interviews. Yet some of the women were equivocal about the precise nature of the relationship between infertility and social interactions. Although the majority of women agreed that infertility could lead to mocking, insults, duplicitous friendships, and, ultimately, ostracism, some women felt that such generalizations failed to capture the nuance of individual women's experiences: in addition to a woman's infertility status influencing her interactions, her own behaviors towards the community, friends, and family will shape the nature of her interactions. Once this consideration was taken into account, however, most women still argued that infertile women face a variety of social stressors.

Physical Health

In response to the question "Do you think your infertility has had an impact on your health," several women discussed their physical health impairments. However,

the relationship between infertility and physical health is somewhat ambiguous, as the starting point in the cycle between infertility and the health deterioration is difficult to determine. Many women reported having had or needing to have an operation to remove a uterine fibroid, which was diagnosed as the root of their difficulties conceiving; this surgery was often perceived to be the cause of the development of physical ailments not experienced prior to the surgery. For some, this simply meant exercising caution so as not to reverse the progress from the surgery. For others, moderate physical symptoms appeared:

I was actually very strong sometime back, but I had a surgery, so my health is better now compared to 1 year ago. I know my strength has gone down a little bit. I'm scared to do more rigorous activities because of fear of the harm to the surgery I had. [Age 41, infertile, 4 children]

Sometimes I feel sick. But my last child I had 2 operations before I got him. That is why I'm coming to see the doctor. My operation has a problem. Sometimes I feel pain at the mark. [Age 36, infertile, 1 child]

A few women had not yet had the fibroid removed, which also led to the physical manifestation of symptoms:

I have fibroid and I think about it. I think I'm a little sick with that fibroid. It causes physical and emotional distress to me. I've been spending a lot of-it makes me think. I bear the thinking and stress alone, but I don't extend it to others. [Age 40, infertile, childless]

Five years ago I was strong, it is now that I am getting sick. Yes. Formerly no menstrual problem, but now I'm having serious abdominal pains. They say it is fibroid that is growing. [Age 36, infertile, childless]

Women with fibroids were not the only respondents to report physical health ailments. A large number of respondents reported headaches and body aches related to their infertility. One 32 year old mother of one child said "I'm ok at first, but I've started having some headaches. I think about it, sometimes I get a headache thinking about it." A few women suggested that social stressors led to reduced immunity, which in turn caused an increase in susceptibility. A respondent shared:

I get chills. I have recent health problems, joint pains. I think about having a child. There is an emotional effect. I have lost weight. I am praying that it will get better. Thinking too much about the problem will make me sick. I get abdominal pains, and swollen breasts during menstrual period. I feel weak. [Age 24, infertile, childless]

Another woman, age 41, captured the phenomenon with her story of a strained interaction with someone she felt she had provided social motherhood for:

Before I got married I was not the kind of person who got sick. But now I get headaches, joint pains, malaria We had someone come to visit. I cared for her like my baby, but she left without saying why and it gave me great emotional problems. My doctor said it would give me a heart attack. I took bp [blood pressure] meds. It has really affected me. It's about 5 weeks now. They just take that joy, it dampens one's hope. It's really affected me. That is the headache, the joint pains. I don't have a good tummy. I'm very emotional. I'm trying not to get down. My doctors, many people say it's not good for conception. In the long run I'm being mistreated. [Age 41, infertile, childless]

It is clear from the accounts of the infertile women in this study that they believe their difficulties conceiving have an impact on their physical health, whether directly, by leading to aches and pains, or more indirectly, such as headaches related to stress or side-effects from infertility treatments. However, it is worth noting that it cannot be ascertained whether infertile women do, in fact, experience such physical ailments as headaches and body pains any more frequently or more severely than do women who do not have difficulties conceiving.

Gendered Experiences

A simple tally of the instances of male and female ostracism mentioned by the women in the study would suggest that there are few differences in the stigmatization and social consequences of infertility by gender. However, these counts mask the differences in severity of ostracism faced by men and women. Although many respondents acknowledged that men may face mocking and name-calling, they also

suggested that these experiences were more severe for women. In addition, many women noted that it was much easier for a man to pass the blame for infertility onto his wife. The issue of blame repeatedly surfaced when discussing gendered experiences with infertility. As one woman succinctly put it, “They always assume it’s the woman’s fault” (Age 34, infertile, 2 children). Another respondent elaborated on this theme:

For a male, it’s not really a problem. The man might only have a problem with ridiculous gestures from the friends. When he has a problem with this, he’s going to pass it on to the woman when he comes home. [Age 41, infertile, 4 children]

Some women hypothesized that the reason blame could be so easily shifted to the female partner was that it is easy to label a woman as fertile or infertile simply on the physical manifestations of pregnancy:

Theirs are better because normally they don’t have the belly so they don’t know. It is better than the ladies. It is when they don’t see you with it that they start complaining. The men when they have to go to the doctor they don’t go because they don’t think they have the problem. They normally think that it is we, the ladies, who have the problem. They should test both partners to see whose fault. The men should come in too. [Age 34, infertile, childless]

Moreover, women are expected to accept the blame, and may even go so far as to seek a secret outside partnership to protect the husband’s social standing and reputation:

Mostly do they know it’s the man? They think it’s the woman. Even if the medical report says the man is impotent, their woman won’t tell anyone. [Age 36, infertile, childless]

[For women], people will be gossiping, especially women. For men, any woman can bring a child and give it to him, and nobody will know. Since it’s women who get pregnant, people notice easily than men. [Age 38, infertile, 1 child]

Despite the feeling that men can shift blame to the women, several women acknowledged that men are likely to be laughed at and mocked in the couple's difficulties conceiving are known to his friends or the community. According to one respondent, "His friends can even laugh at him and say he is not a man" (Age 30, infertile, 1 child). Moreover, if blame can be assigned to the man, he is likely to face ostracism and marital instability comparable to that experienced by an infertile woman:

The man, they won't know he's impotent, so they'll tell him to go for another woman. He'll get more support. After they find out he is impotent they will do the same they do to the woman. [Age 35, infertile, childless]

A number of women said that they could not speak to the issue of male experiences of infertility, as they had not known of any cases of male infertility; however, these women did not find it difficult to discuss the experiences of infertile women. The "don't know" response to questions pertaining to male experiences with infertility is in itself telling. These responses seemed to reflect not a lack of knowledge of infertility in the community, but rather the belief that the infertility factor could more naturally be attributed to the female partner. For example, when asked to compare community, friend, and family support received by a fertile and an infertile woman, one childless, infertile 30 year old respondent said "One who has kids has friends so she has many people to help her. Depends. But the one who doesn't have kids needs more support. The one who has kids has a lot of responsibilities so the family may want to help her out." When asked about male experiences with infertility, however, she simply said "I haven't come across any such man." This reinforces the belief that gender differences in infertility experiences are, in part, rooted in the difficulties inherent in identifying male factor infertility.

In general, women felt that blame is disproportionately assigned to the female partner, due largely to the fact that women exhibit the physical signs of pregnancy, and are therefore more readily identified as infertile when a child is not conceived. Though many respondents acknowledged that men also experience mocking and ostracism, they also felt that men were better able to deflect the stigma by assigning blame to the female partner.

2.4.4 *Community Observations*

Social Interactions

Contrary to the expected views, fertile women's accounts of the social consequences of infertility were closely aligned with the reports of infertile women. Fertile women acknowledged that childless women are excluded from adult conversations and community decisions. One childless 29 year old woman who identified as fertile stated that "Sometimes they don't expect you to talk when two children are fighting or crying because you don't have any children." In addition, some bystanders noted that infertile women are likely to face pressure from in-laws; even if a woman receives support from friends, church members, and other sources, interactions with the marital family may become acrimonious, placing strain on the marriage:

The family, when you get married you are two, your in-laws will talk to you anyhow. Your friends will understand, but your mother in-law wants a grandchild. The woman's side will be ok but the other side the mother in-law will accuse you and it could destroy the marriage, even though the problem could be with the man. [Age 22, fertile, childless]

The most commonly cited reaction to infertility was gossip or verbal assault in the form of mocking or insults. Many bystanders also recognized that infertility is likely to have a negative effect on social networks:

In this modern time, they will insult you. This lady can't give birth. They gossip about you. In Africa, our culture, when you find it difficult to have children, they call you names, "witch", you'll be shunned, you'll have few friends. [Age 37, fertile, 1 child]

Several respondents hypothesized that the strained social interactions with community members might be condemnation related to social beliefs regarding the sources of infertility:

Some will say you are barren. Have a lot of misconceptions about you. Some may think it is a curse on the family. But I think it's all up to God. It may be due to low level of education. [Age 29, fertile, childless]

It's not friendly. People here attach a lot of ideas as to why you don't have a child, like you had an abortion, or that you are a witch. Some will think that you don't like children so even if you get pregnant you intentionally abort. Sometimes people choose not to have it. 'I don't want to have a child and that is the end' Most of this is attributed to witchcraft, like the man has gone to exchange his money for magical purposes. It goes on and on. They will say that to have a son proves that you are a man. I think infertility in Ghana is not very common, but people attribute it to the individual. If you are 36, 38, and you haven't had a child, people will say it is because of something from a former life, or it is your grandmother, witchcraft, or that your womb has been taken to the North or is being used for ritual purposes. They attribute it to the spirit. In general, you don't want to take up responsibility. [Age 25, fertile, childless]

Medical identification of infertility factors is increasingly common; however, beliefs that infertility arises from immoral behavior, a history of abortions, witchcraft, or an ancestral curse are not uncommon. On the whole, the accounts of fertile bystanders validated the responses of infertile women. In keeping with the experiences reported by infertile women, fertile respondents stated that women are likely to face stigmatization, diminished social networks, familial pressure, marital instability, and exclusion from adult discussions in response to their infertility.

Gendered Experiences

Bystanders not only concurred that infertile women face considerable familial pressure and social stigma, but also that the experiences of infertile women are qualitatively different from the experiences of men. Some fertile respondents acknowledged that men are likely to experience mocking, insults, and general stigma. However, similar to reports of infertile women, bystanders contended that the severity of these negative social interactions is not comparable. Similarly, a childless fertile woman, age 29, said "They are always teasing them [men]. Sometimes they [community members] insult them [men] too, same applies to the women, but the men's are not like the women."

Other respondents felt that, if men are insulted or ridiculed at all, it is less severe than the ostracism faced by women. A childless 41 year old bystander said “A man is not like a woman. Here, it is only women who will experience a lot of stuff over childbirth. Men will not experience it.” Another respondent felt that “The men have no problem. They don’t get as much insults and telling off as the women” (Age 26, fertile, 1 child). A third respondent summarized:

For the men, they don’t have much problems compared to women, the statistics. A woman can easily get pregnant by someone else and say it’s for you. Before a wife can come out and say my husband is impotent it is not easy. But a man can insult his wife in public. [Age 37, fertile, 1 child]

Similar to the explanations offered by infertile women, fertile respondents attributed the gender differential primarily to the ability of men to shift the blame for the infertility to their female partners:

I don’t think that is very common because it is blamed on the woman; the men rally around their wives, the woman is attacked. The woman will take medication, but the man will just sit around the house. Sometimes the man, you are limited when it comes to community decisions, you are not respected and your ideas will not be taken seriously. They will say if you are a man and you cannot have children with your wife why don’t you take another woman. [Age 25, fertile, childless]

One woman summarized “Normally, it is not common to know if the man is impotent or not. They see the wives as that and not themselves” (Age 38, fertile, childless). In the words of a childless 29 year old woman with no infertility factor:

[Regarding women] Ok, for example, if you don’t have children, they don’t have mercy on you. They have the bad mind that you aborted a lot of pregnancies before. [Regarding men] They would try to give him medicine to see if he can give birth. After they fail they say this man, don’t marry him, he can’t have children. [Age 29, fertile, childless]

Overall, the insider and bystander accounts of the lived experiences of infertile women were remarkably similar. Both fertile and infertile respondents acknowledged that infertility is associated with marital instability and strained social interactions. Moreover, both groups pointed out substantial differences in the experiences of infertile men and women.

2.5 Discussion

The results presented above demonstrate that infertility has profound psychological and social consequences for women in Ghana. In keeping with prior research (Gijssels, Mgalla et al. 2001), many of the women in this study mentioned that infertile women have “no child to send,” meaning that their inability to conceive disadvantages them, both socially and economically. Infertility also contributes to ostracism and strained social interactions, including mocking, insults, and exclusion from conversations related to childbearing.

In many cases, infertility also leads to familial pressure and marital instability. Infertile respondents cited fears of infidelity and divorce, and some had already experienced at least one marital dissolution in response to their childbearing difficulties. Emotional strain was a commonly cited concern, ranging from loneliness and worry to severe stress and depression-like symptoms. Physical ailments were also cited by some, ranging from headaches and body aches to negative reactions to infertility treatments. However, due to data limitations of the study, it is unclear whether infertile women are significantly more likely to experience these ailments than are fertile women; additional research is needed to explore the precise relationship between infertility and physical health.

Although it was suggested that men also experience the deleterious effects of infertility, it seems that the experiences of men differ from the experiences of women, both in quality and quantity. When male factor infertility can be identified, men are likely to experience the same social stressors as women face—particularly in the form of verbal assault. However, men are often shielded by a process of blame shifting which tends to place the responsibility for infertility squarely on the shoulders of the female partner.

Also apparent from the above discussion is the interrelated nature of the rela-

tionships. Respondents in the study did not discuss each of the themes as separate ideas; rather, the coded themes represent various components of a process. This is exemplified by the insights of a 37 year old infertile woman who said:

I don't think he experiences exactly what the woman goes through. I don't think his friends bother to talk about it. I don't think they ever talk about it. Here in the community, most of the blame is on the woman. There are men who wouldn't go to the hospital to get a sperm count because they think it is the woman. In the case of the woman being unsure of not having kids some of it may stem from the in-laws. They put pressure on her because they want children. Also, she is worried that they man will go outside for a child and that will bring her disgrace. There is so much anxiety. Also, she will see her friends with children. [Age 37, infertile, childless]

A unique contribution of the current study is the inclusion of fertile women as external observers of the treatment of infertile women. Perhaps surprisingly, fertile respondents in this study corroborated the reports of infertile women. Many fertile women spoke to the multiple pressures faced by infertile women, with particular focus on strained interactions with the marital family and members of the broader community. Similarly, these bystanders also reported that the negative experiences of infertile men are less severe than those of women owing to their ability to deny responsibility for the couple's difficulty conceiving. Additionally, the study provides some preliminary evidence that women believe that their infertility impacts not only their social standing, but the mental and physical health as well, suggesting that there is an impetus to explore further the relationship between infertility and physical health.

The current study examines the relationship between infertility and marital stability, social interactions, and mental and physical health; however, there are some limitations. First, the findings outlined above are not generalizable due to the purposive nature of the sampling frame. Moreover, the small sample size serves to reduce the statistical power, eliminating the possibility of causal modeling. An important direction for future research will be to draw and analyze a population-based sample, with a sample size adequate to capture the experiences of women

suffering both from primary and from secondary infertility. In spite of these limitations, the findings presented herein suggest that the consequences of infertility in Ghana are both widespread and severe; infertility is clearly of concern as more than a narrowly defined reproductive health issue.

Infertility and Uncertainty: Measurement of Infertility in Sub-Saharan Africa

3.1 Introduction

While involuntary childlessness has been recognized to have detrimental psychological and emotional effects in a variety of contexts, the effects are particularly deleterious for couples—and, in particular, for women—in sub-Saharan Africa (Dyer, Abrahams, Hoffman, and Spuy 2002; Dyer, Abrahams, Mokoena, Lombard, and Spuy 2005). These amplified effects are attributed to the high value placed on children in Africa (Dyer 2007). In this context, the high rates of infertility commonly found in much of sub-Saharan Africa (Mayaud 2001; Larsen 2000) are troubling. Infertile men and women appear to face a variety of social and economic stressors as a result of their inability to achieve their desired fertility. However, at the crux of this matter is our conceptualization of infertility; without adequate measures, the social and demographic impact of infertility is difficult to pinpoint.

Much of the literature on defining infertility in SSA focuses on the most appropriate measure for estimating prevalence, with emphasis on the utility of demographic measures in particular (see, for example, Larsen 2000; Larsen 2005; Larsen and Ridders 2001). While a clear picture of prevalence is a critical step

in understanding infertility, the most conservative and appropriate measure at the aggregate level may not correlate closely to the lived experience of infertility for individual men and women. In other words, biological subfecundity or sterility may or may not overlap with local and personal definitions of fertility status. Little attention has been paid to the utility of self-identified infertility, due in part to the absence of appropriate measures in survey data in the region. Nor is it clear how self-identified infertility and the more objective measures outlined in the biomedical and demographic literatures relate to one another. However, for many outcomes of interest, including treatment seeking, fertility-specific distress, marital satisfaction, and divorce, self-identification may be more salient than more objective, externally defined measures. Most infertility research in SSA relies on measures constructed from marriage and pregnancy histories; how these constructed measures correlate with self-identification may prove important for determining the most useful constructed measure in the absence of self-identified measures.

In order to gain a clear understanding of the social and demographic implications of infertility, it is crucial to begin with a clear definition of infertility. Measures which are appropriate for modeling prevalence and aggregate level phenomena may not be adequate for understanding individual experiences. Given the dearth of analyses exploring the most apposite definition of infertility for understanding social phenomena at the individual level, in this paper I analyze correlations, test-retest models, and random effects models to examine the relationship between and stability of a variety of infertility measures across eight waves of panel data from Ghana.

3.2 Literature Review

3.2.1 *Considerations in the Measurement of Infertility*

Definitional issues associated with infertility research have important implications, both for estimating prevalence and for comparing the impact of infertility across time and place. In the biomedical literature, clinical definitions identify infertility based on conception, with infertility defined as no conception after 12 months of regular, unprotected sex; epidemiological studies rely on a similar def-

initiation, extending the requisite length of unprotected intercourse to 24 months (Marchbanks et al. 1989). Demographers, in contrast, consider live births for a sexually active woman not using contraception, rather than focusing on conception (Larsen 2005). Among demographers, the optimal time period without a live birth for identifying infertility is still open to debate, though most measures center on either 5 or 7 years.

The distinction between live birth and conception results largely from the applications of the measures to different settings. Clinical definitions of infertility, for example, are often used in medical settings when individuals or couples seek treatment. Thus, the goal is first to make sure that a couple can conceive, and then to address any difficulties carrying the pregnancy, once achieved, to term, as this distinct processes may represent separate facets of infertility (Marchbanks et al. 1989). Short waiting times (the length of time a woman must unsuccessfully try to achieve a pregnancy before she is classified as infertile) and a focus on conception thus ensure that couples will receive treatment early to address any potential problems. However, where identifying infertility quickly to facilitate a timely response is not the end goal, clinical measures may overestimate infertility; couples who are not infertile may still naturally take longer than twelve months to conceive without this waiting time representing an underlying problem (Larsen 2005). Additionally, while conception may be measured with relative accuracy in a clinical setting, survey responses may not accurately capture conception (Larsen 1994), and may underestimate pregnancy loss. Demographic measures, which tend to be constructed based on survey data, and are generally applied to estimate prevalence and aggregate effects of infertility, thus focus on live births rather than conception. While this could still potentially slightly overestimate subfecundity from a purely biological standpoint, the long waiting times to birth used for these measures tends to minimize this bias.

In addition to waiting times and the focus on birth versus conception, important considerations in measuring infertility also include contraceptive behavior and fertility intentions. In particular, when contraceptives are used, lack of pregnancy is less likely to reflect an underlying inability to conceive than to reflect the effectiveness of the contraceptive method. This is not to say that none of the couples who are using contraceptive are, in fact, subfecund; however, failing to remove

successful contraceptors from the pool of women at risk for infertility would result in a substantial overestimate of infertility (Marchbanks et al. 198; Larsen 1994). The effect of controlling for various types of contraceptives on measurement is also unclear. While western contraceptives may arguably be more effective than traditional methods at preventing pregnancy, research in Tanzania and Nigeria has suggested that some women may believe that western contraceptives cause infertility and, thus, opt for non-western methods instead (Allen 2001; Koster-Oyekan 1999; Mgalla and Boerma 2001).

The role of fertility desires and intentions in shaping fertility behavior is also unclear. While women who express a desire to have no more children may be consciously limiting fertility via methods other than contraceptive use (such as longer periods of breastfeeding or abstinence), it may also be the case that women's fertility desires have a limited impact on their fertility behavior due, in part, to the strong role of men's desires in shaping fertility behavior—particularly in SSA (Dadoo 1998; DeRose and Ezeh 2005; Ezeh 1993); controlling for desires net of contraceptive use may be important. While intentions arguably do not factor into the underlying biological basis of infertility, Greil and colleagues (Greil and McQuillan 2004; Greil, McQuillan, Johnson, Slauson-Blevins, and Shreffler 2010) have shown that women who are infertile with intent—that is, women who cannot have (additional) children they desire—have poorer health, report distress, and experience other negative consequences to a greater extent than women who are biologically infertile but who are not actively trying to conceive. Therefore, although excluding those who do not wish to conceive from the pool of infertile women may underestimate the underlying biological presence of infertility, including those who are infertile without intent may cause a downward bias in estimates of the social impact of infertility.

In addition, a variety of background characteristics may influence the biological and social determinants of infertility. For instance, previous studies have shown that there is a natural decline in fecundability over time, particularly over the age of 35 (Broekmans et al. 2007; Larsen 1994); underlying biological infertility, then, can be expected to increase as cohorts age. Whether this relationship holds when subjective measures are used, however, is unclear. Additionally, some research in the U.S. (Stephen and Chandra 2006) and SSA (Frank 1983; White et al. 2001) has

suggested that there are racial and ethnic differences in the prevalence of infertility. Additionally, socially determined factors may also influence the prevalence and identification of infertility. For instance, religious affiliation may be associated with differential rates of infertility in SSA, perhaps as a result of differences in sexual and childbearing rites and norms (Anarfi and Owusu 2010; Ericksen and Brunette 1996). Acceptable waiting time to pregnancy, which are largely shaped by prevailing cultural norms (see, for example, Allen 2001), may also influence infertility; though unlikely to impact objectively defined measures, waiting times may influence who is identified as infertile by subjective measures. However, the influence of many of these variables may differ substantially in different cultural settings.

3.2.2 *Measurement of Infertility in SSA*

Fertility in SSA has long been of interest to demographers, partly because fertility transitions have not been completed throughout the sub-continent. Extant research on the region has suggested that a high value is placed on childbearing, both due to the emotional fulfilment provided by children, and as a result of the tangible social and socioeconomic benefits of having children (Geelhoed et al. 2002; Mogobe 2005; Richards 2002; Sundby 2002). While desires and family size are on the decline, the total fertility rate (TFR) in the sub-continent remains high at 5.2 children per woman (in Ghana, the TFR is 4.0; Population Reference Bureau 2010). Some researchers (Dodoo 1998; DeRose and Ezeh 2005; Ezeh 1993) suggest that changes in fertility desires among women in SSA may not correspond to changes in fertility behaviors as a result of couple gender dynamics: where there is not a high premium placed on gender egalitarianism in relationship, partner fertility preferences appear to asymmetrically influence fertility behaviors. Additionally, Bongaarts et al. (1984) note that the proximate determinants of fertility, such as cultural norms regarding postpartum abstinence and breastfeeding, also shape family formation and child spacing. In SSA, long periods of postpartum abstinence are common, and high rates of breastfeeding give rise to extended lactational amenorrhea. While contraceptive use in SSA is low (see Chapter 1 for a more in-depth discussion), prevalence is on the rise. Finally, labor migration is

an increasingly common facet of family life in SSA (Adepoju and Mbugua 1997; Larsen 1994; Larsen 1997; Oppong 1997), resulting in (sometimes long) stints of abstinence. In sum, the childbearing context in SSA is unique, and necessitates and tailored approach to measuring infertility.

As previously mentioned, estimates of prevalence may be biased upward if the temporal component of the measure is misidentified. Specifically, a couple may still be biologically capable of conceiving a child naturally beyond 12 months of unprotected sex. Relying on a short waiting time to estimate prevalence of infertility may lead to a substantial upward bias of estimates (Larsen 2005). Moreover, postpartum amenorrhea and lactation, misreported timing of births, underreporting of childlessness, and differential exposure to intercourse by family size intentions, age, geographic proximity (in the case of labor migration, for example) and marital status can introduce further bias. Thus, Larsen advocates defining infertility as having no live birth for at least 5 (or, for a more conservative estimate, 7) years from either the date of marriage, in the case of primary infertility (childlessness), or the date of last birth, in the case of secondary infertility (infertility subsequent to the birth of a child).

Larsen (2000), using both the 5 and 7 year measures outlined above, estimates rates for both primary and secondary infertility among women in sub-Saharan Africa. These estimates are based on data from the Demographic Health Surveys (DHS). While primary infertility rates are relatively low in much of the region (around 2% in Ghana), secondary infertility rates are much higher (15-16% in Ghana). This difference is present primarily because secondary infertility in developing nations is caused predominately by postpartum infections and sexually transmitted diseases. Thus, an infection from giving birth to a first or second child, for example, may leave a woman unable to bear further desired children.

In SSA, secondary infertility may be nearly as troubling as primary infertility; research in Chad, for example, has suggested that local definitions of infertility identify not only childlessness, but also having too few children, or too few of the desired sex (Leonard 2002). While primary infertility appears to have fallen to the expected biological level (around 3%), on par with global estimates, secondary infertility remains high in SSA due to the social conditions giving rise to secondary infertility (Larsen and Raggars 2001; Zaba, Boerma, and Blacker (2001). Thus,

accurate measurement of secondary infertility is particularly important.

Though the demographic measures of infertility outlined above are unarguably useful for estimating prevalence, it is unclear which definition will be most suitable for examining the link between infertility and social outcomes. Furthermore, little is known about the utility of biomedical definitions for examining the social predictors and consequences of infertility. The demographic measures outlined in the literature are purposely conservative to ensure that prevalence is not overestimated due to factors such as lactational amenorrhea, deliberate child spacing, and spousal labor migration. While the definitional requirement of five to seven years without the birth of a child results in a very stable measure of infertility, the deleterious effects of infertility are likely to be driven by local understandings of infertility, which may (and often do) involve a shorter waiting time to conception (Barden-O'Fallon 2005).

It may be the case, then, that self-assessed infertility is the most salient indicator of infertility for a variety of social outcomes, as the negative effects of infertility will presumably be most likely to arise when a woman perceives herself to be infertile. For example, marital discord will likely arise only when difficulties conceiving have been acknowledged, whether explicitly or not—if not by the couple, then at least by one member of the dyad. However, given that self-defined infertility may vary substantially between groups of women, based partly on variation in social contexts, acceptable waiting times to pregnancy are likely to differ, which will likely reduce the stability of the measure. Leonard (2001) notes that demographic definitions assume that the definition of infertility is the same across time and place, when it likely is not; she contends that self-identified measures may be more appropriate when considering social outcomes.

Thus, obtaining a full, accurate understanding of the implications of infertility in sub-Saharan Africa requires the use of an appropriate, nuanced definition of infertility. This analysis seeks to identify (1) which measure is the most reliable over time (2) which measure is most closely tied to self-identified infertility, and (3) which measures relate to background characteristics in a predictable, expected manner.

3.3 Data and Methods

3.3.1 *Data*

I utilize longitudinal data collected by the Population Council of New York and the University of Cape Coast between 1998 and 2004. Data were collected in six geographically dispersed communities in the Central, Greater Accra, and Western regions of Ghana (Casterline 2007). Sampling maximized ethnic, economic, kinship, and between-community diversity. Women between the ages of 15 and 50 of all marital statuses were sampled. Although male partners were also sampled, the analyses herein will examine only the data for female respondents due to the ambiguities associated with measuring male infertility in the dataset. In the smallest four communities, all women fitting the screen were selected for the survey. In the second largest community, a sub-sample of eligible women was selected using simple random sampling. In the largest community, four geographic units were demarcated. One geographic unit was randomly selected, and a sub-sample was selected from within the geographic area using simple random sampling. For a full description of sampling methods, see Casterline (2007).

Data were collected in 8 rounds. Respondents were given a main survey containing questions relating to demographic and background characteristics, fertility attitudes and behaviors, contraceptive behavior, and other variables. Respondents were also asked to provide calendar data for the months between waves for a select set of indicators. Thus, in addition to completing the main survey, women answered detailed retrospective information regarding factors such as birth control use for each month between the current wave and the previous one. Cases were added between rounds to adjust for attrition: in round one, 1,219 women were sampled; 219 women were added in round two. In addition to completing the round two questionnaire, the 219 women added during the second round also retrospectively completed the round one questionnaire. Twelve cases were dropped due to attrition, resulting in a sample size of 1,373. To restrict the sample to women who are within the demographic age of fecundability (ages 15-49), women over the age of 50 were dropped from the sample. The final sample size for the analysis is 1,350.

Questionnaires include basic demographics, marital and birth history, self-rated

health, and social network information. Missing data for background and demographic variables was around 3% in most cases, while missing data was more varied among other indicators. However, missing data did not exceed 30% for any of the variables included in the analyses; at 19.27%, the variable measuring fertility desires had the highest amount of missing data. Missing data were multiply imputed using the ICE procedure in Stata 11; 10 imputed datasets were created, and results shown are averaged across these datasets using the *mim* procedure, which accounts for the uncertainty introduced by imputation by adjusting the standard errors.

3.3.2 *Measures*

For the analyses which follow, four basic objective measures of infertility are considered: clinical, epidemiological, demographic 5 year, and demographic 7 year infertility. Strictly speaking, a clinical definition identifies a woman who has not conceived after 12 months of regular, unprotected sex as infertile. An epidemiological definition is similar, but extends the time span to 24 months of unprotected intercourse without conception. The demographic definitions of infertility identify a woman as infertile if she has not achieved a live birth after 5 or 7 years of unprotected intercourse. Although a strict biomedical definition of the clinical and epidemiological measures would focus on conception while demographic measures focus on live births (Larsen 2005), the focus for all of the objective measures is on live births rather than conception due to difficulties accurately identifying conception (particularly early pregnancy wastage, which may be underestimated by as much as 50% in survey data for developing countries; Casterline 1989) in survey data. Thus, the primary distinguishing factor between these measures is waiting time to infertility.

Additionally, I consider self-assessed infertility, as measured by responses to the question "When you want to become pregnant, do you become pregnant quickly, or does it take a long time?" Women who responded "Takes a long time" or "Can no longer become pregnant" were classified as infertile. Additionally, a small number of women (292 women pooled across 4 waves) responded "Cannot get pregnant" to a second question, "Would you like to have (a/another) child (with your husband/partner) or would you prefer not to have any (more) children (with

him)?" were also classified as infertile. Among those classified as infertile, 83.5% responded "Takes a long time", while only 16.5% said that it is impossible (based on either measure) for them to conceive.

One limitation of measuring self-identification in this way is that a response of "takes a long time" could have different meanings for different respondents. This response could conceivably mean that a woman is subfecund but not infertile, or that she is sterile but reluctant to classify herself as such (or is unaware that she is medically sterile). In a U.S. based study involving a non-representative sample (primarily white, middle-class women), Greil (1991) found that women undergoing treatment were more likely to identify as "not yet pregnant" than "infertile", lending some validity to the use of the response "takes a long time" as a measure of infertility.

It is worth noting that, based on this subjective measure, waiting times to pregnancy may vary substantially. For instance, a woman who has been trying to become pregnant for one month may say that she cannot get pregnant, while a woman who has not had a child for seven years may not consider herself infertile even if she has been having unprotected intercourse. The self-identified infertility questions were asked only in waves 1, 6, 7, and 8.

A substantial portion (25.5% of the sample) responded "don't know" when asked whether they become pregnant quickly. Conceivably, these women may differ from those who are certain in socially significant ways. While women who express uncertainty about their infertility status could conceivably say that they don't know because they are not currently sexually active (for instance, if their husbands have migrated for work), these women are unlikely to be identified once birth control is accounted for (discussed in detail below) given that the birth control measure includes abstinence. These women were treated in two ways: first, they were coded 0 on the self-identified infertility measure, and a separate measure was created to capture uncertainty about infertility, with women who responded "don't know" coded as 1 and all other respondents coded 0. This distinction was made to capture the substantive difference between women who are certain that they are not infertile and those who responded "don't know"; women who are uncertain likely suspect that they may have fertility difficulties, but are unwilling to positively identify themselves as of yet. Second, a combined self-identification

and uncertainty measure was created, in which a woman was coded 1 if she identified as infertile or if she said "don't know" to the self-identification question. Descriptives, correlations, test-retest, and random effects models were run to compare these methods for treating uncertainty. Results suggested that the combined self-identification measure was the more stable, reliable measure. Thus, for the analyses which follow, the focus is on the combined measure of self-identification. The results of further analyses with the measure separated into self-identification and uncertainty are presented in Appendix C.

Only women who report being married or in a union were considered at risk for being infertile. Waiting times to birth were calculated based on the time since the most recent birth for women who had given birth to at least one child. For women who had never given birth, waiting times were based on the date of marriage or the date of the beginning of the union for unmarried women in sexual unions. Due to small cell counts for cases of primary infertility (as few as 7 women were infertile by the end of the 8 waves when using the most conservative measures of primary infertility), so for this analysis, primary (childlessness) and secondary infertility (subsequent to the birth of at least one child) were combined into one measure. For all measures of infertility, infertile women are coded as 1 and women not identified as infertile by that measure coded as 0. These basic measures do not account for birth control use or fertility desires; measures included in the analysis below control for these factors.

Only non-contracepting women who have failed to conceive within the requisite time frame for the definition in question were considered infertile for most of the analyses; following Larsen (2005), contracepting women who have not conceived were considered successful contraceptors, and were coded with a 0 on the infertility measure. Among women who were contracepting during an earlier wave of the survey, the risk period began at the first survey in which no contraceptive use is reported. For example, a woman who had not given birth in six years, but who had been contracepting for the first three years of that period would be considered infertile by clinical (12 month) and epidemiological (24 month) definitions of infertility, but not by either of the demographic measures.

The questions regarding current contraceptive use were drawn from both the calendar data and the main survey, so detailed information are available for each

month during the study period. Where birth control use was available from the main survey, these data were used; where data on birth control use was missing (about 40% of cases), birth control use data was drawn from the calendar data.

For each month and each wave, women were asked to recall whether they were using oral contraceptives, injectables, diaphragm, foams or jellies, condoms, intrauterine devices (IUD), sterilization of one or both partners, withdrawal (coitus interruptus), herbs, or Norplant, or any other method (including abstinence). Given the variance in effectiveness of these methods, two sets of measures were constructed for each of the measures of infertility. The first set of measures control for any birth control use—that is, if respondents reported using one or more of any of the contraceptive methods in the survey, they were considered successful contraceptors and coded not infertile. The second set considers only western contraceptive methods: IUD, condoms, the pill, sterilization, injectables, diaphragm, foams or jellies, or Norplant. A limitation of controlling for contraceptive use, however, is that infertile women may use contraceptives, and measures accounting for birth control use would inaccurately classify these women as not infertile, resulting in a false negative. However, this limitation may be more problematic for estimating prevalence than for understanding social consequences of infertility; while false negatives would create a downward bias in estimates of biological sterility, if contraceptive use stems from the couple (and broader community) being unaware of the underlying sterility, it would be unlikely that this unknown sterility would have serious social consequences.

Table 3.1 and Figure 3.1 provide several examples to demonstrate how birth control use impacts the coding of infertility. Table 3.1 contains fictional birth control use for 6 respondents across 8 waves of data; the fictional respondents are listed as either using birth control or not in each wave. A few simple assumptions will be helpful to clearly demonstrate how birth control use impacts infertility coding. First, assume that all respondents have been trying to conceive for 11 months prior to the first wave (and measurement at wave 1 marks the 12 month point). Second, for the sake of simplicity, assume that data were collected at one year intervals, so the time between waves is 12 months (in reality, there are slightly less than 12 months between interviews). Finally, assume that all respondents in the table are identical except for their use of contraceptives—that is, they are all

Table 3.1. Theoretical Birth Control Use

	W1	W2	W3	W4	W5	W6	W7	W8
Respondent 1	Using	Using	Not	Using	Using	Not	Not	Using
Respondent 2	Not	Not	Not	Using	Not	Not	Using	Using
Respondent 3	Using	Using	Not	Not	Not	Not	Not	Not
Respondent 4	Using	Using	Using	Using	Not	Not	Not	Not
Respondent 5	Not	Not	Using	Not	Using	Not	Using	Not
Respondent 6	Not	Not	Not	Not	Not	Not	Not	Not

married, intending to conceive, have been trying to conceive for the same length of time, and have not had any children across the 8 waves.

Figure 3.1 provides a graphic display of how identification of standard clinical infertility is influenced by birth control use. A line (or point, where applicable) is provided for each of the 6 theoretical respondents showing the waves in which the respondent is identified as infertile after accounting for birth control use. Respondent 1 is identified as infertile by the clinical (12 month) measure only in wave 7. In waves 1 and 2, this respondent is using contraceptives, and is thus classified as not infertile. While Respondent 1 is not using birth control in wave 3, the wave represents the first (measured) point in time when the respondent is not using contraceptives. In order to be classified as infertile, she must have not been using birth control for 12 consecutive months (i.e. for two waves). Note that, regardless of whether this respondent stopped using birth control 3 days after her interview in wave 2 or 1 day before her interview at wave 3, she would be classified as fertile. Respondent 1 begins using birth control again in wave 4 (and is thus not classified as infertile once again), stopping again in wave 6. The intervals between waves 6 and 7 is 12 months, causing Respondent 1 to be classified as infertile in wave 7. However, she begins using birth control once again in wave 8, and is yet again not infertile.

Given that Respondent 2 entered the survey not using birth control, and given the assumption that wave 1 marks 12 months of trying to get pregnant, this respondent is identified as infertile by the standard clinical measure in waves 1 through 3. However, because she starts using birth control in wave 4, and because wave 5 marks the start of the next period during which she is not contracepting, she is not classified as infertile in either of these waves. She is once again identified as infertile in wave 6 (but not in waves 7 and 8, as she once again reports birth

control use in these waves). Infertility among the remaining fictional respondents can also be seen in Figure 3.1. Given birth control use patterns, Respondent 3 is coded infertile in waves 4 through 8 (and not in 1 to 3), while Respondent 4 is infertile only in waves 6 through 8. As a result of her erratic birth control use, Respondent 5 is classified as infertile only in wave 2, while Respondent 6, who does not report any birth control use in any wave, is infertile in all waves.

However, given the different times to conception required by the other measures, identification as infertile across waves would vary from those observed for the standard clinical measure. For example, based on the same assumptions and birth control use patterns outlined in Table 3.1, only one respondent (Respondent 6) would be identified as infertile by the Demographic 7 year measure due to the long period of time required to conception. Because the self-identified infertility measures do not specify a waiting time, anyone who self-identifies will be infertile in all non-contracepting waves. For example, returning to Respondent 1, she would be infertile in waves 3, 6, and 7.

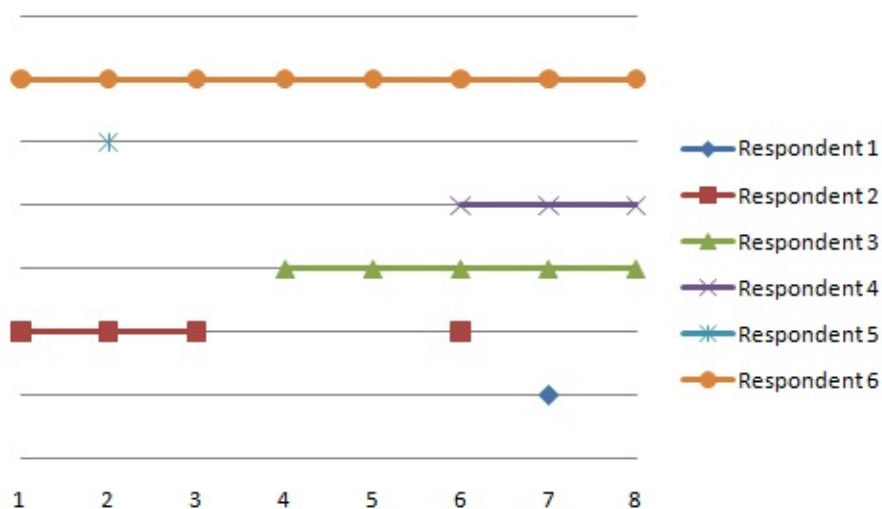


Figure 3.1. Clinical Infertility Based on Table 3.1

The objective measures of infertility focus on women who are infertile with intent (Greil and McQuillan 2004)-that is, women who express a desire to have a(nother) child but cannot. As previously discussed, the role of female partner fertility desires in determining whether the couple actually has another child is

Table 3.2. Percent Using Birth Control by Categories of Time to Pregnancy

	No Birth Control Use	Birth Control Use	N
Long Time	35%	65%	1689
Impossible	27%	73%	332
Don't Know	44%	56%	1348

Note: N provided is pooled across the 4 waves for which the Time to Pregnancy variable was available; does not add up to 5400 because those who said they become pregnant quickly are excluded

ambiguous; versions of variables with and without removing women who stated that they did not want another child from the population of women at risk of infertility were created. In other words, if women said they did not desire to have another child, they were not coded as infertile in one measure, while their desires were not accounted for in the second measure. On average, only around 5 to 6 women were moved from infertile to fertile when desires were accounted for. Correlations (not shown) suggested that fertility desires were not particularly stable over time, but there was little variance in the number of women not counted as infertile across waves, perhaps because those who did not desire to have additional children were also using contraception. Given that self-identification is a subjective measure, desires were not accounted for in this measure.

In light of the fact that self-identification is a subjective measure, and given that respondents select into birth control use, it might be expected that those who believe they are infertile would be less inclined to use contraceptives than those who do not self-identify. Table 3.2 shows the percent of respondents using birth control within each category of the time to pregnancy variable used to construct the self-identification measure. On the whole, birth control use is higher than expected. Among those who say it takes a long time to conceive, 65% report using any form of birth control, while 35% do not. Birth control use is even higher among those who say it is impossible to conceive, but lower among those who say they don't know: a surprising 73% of those who say it is impossible to conceive use contraceptives, while 56% of those who say they don't know use birth control. On the whole, then, birth control use is higher than might be expected considering that these are individuals who self-identify as infertile. Perhaps most surprising is the finding that the highest percentage using birth control are those who say

it is impossible to conceive. This may stem from cultural notions about aging and reproductive fatigue (Bledsoe 2002; discussed in greater detail below), and may also provide some support for the notion that couples use contraceptives for purposes other than preventing pregnancy. For example, Meekers and Calvs (1999) find evidence that condoms are being used for STI prevention.

Given the large number of measures to be explored, it may be helpful to identify three classes of measures to ensure clarity of the discussion: basic measures, which do not account for any form of birth control or fertility desires; standard measures, which account for all forms of birth control and fertility desires; and western measures, which account only for western birth control methods and desires. Thus, there are three possible versions of each of the measures (clinical, epidemiological, demographic 5 and 7 year, and self-identification).

3.3.3 *Analytic Strategy*

I begin by examining the correlations between 1) basic measures of infertility and birth control use reported at each wave, 2) each measure with itself across waves, accounting for standard and western contraceptive use, and 3) each measure with the other measures. Observations for the third set of correlations are pooled over the eight waves of data.

In the second set of analyses, I employ a tetrachoric test-retest model for dichotomous outcomes to examine the stability of measures across waves (Alwin 2007; Johnson 1995). A graphic display of the basic theoretical model is provided in Figure 3.2; however, not all arrows are shown in this figure (for example, errors are not drawn in this figure). The assumption of the model is that the measures of infertility outlined above are indicators of the underlying trait of infertility; however, some of these measures may be more effective at capturing the true underlying trait than others. Infertility, then, is a latent variable, with the various measures of infertility serving as observed indicators. The relationship between these latent variables across waves are examined. For the sake of parsimony, and given the high correlation within biomedical measures and within demographic measures (as discussed below), only one biomedical measure (clinical) and one demographic (7 year) measure are included in the model, as well as self-identification. Because

self-identification measures are not available in waves 2 through 5, the test-retest analysis is limited to waves 6, 7, and 8. Wave 1 is excluded both because trends cannot be continuously assessed throughout waves 2 through 5, and because infertility figures in wave 1 are slightly inflated (discussed in greater detail below).

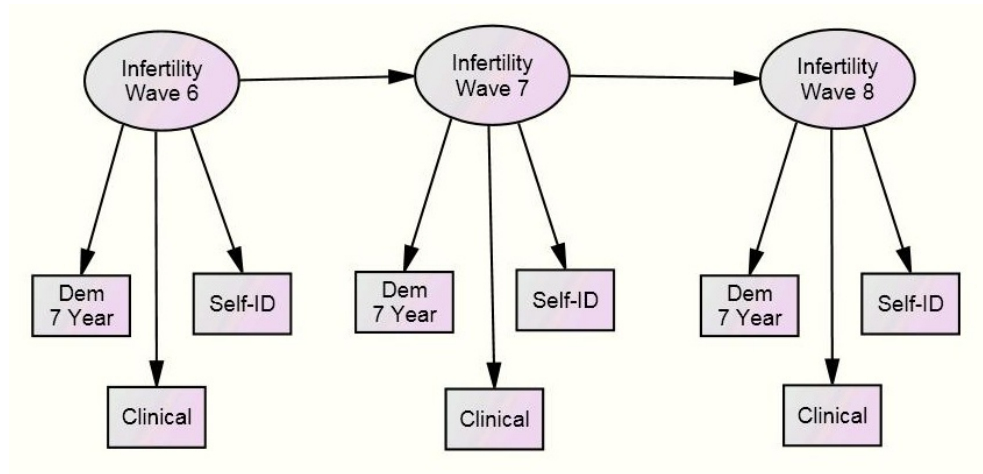


Figure 3.2. Test-Retest Model

For the final set of analyses, observations are pooled across waves to maximize the information available; however, pooling the data across waves violated the assumption of independent observations (Johnson 1995). To adjust for the correlation of observations over time, random effects models are used to compare the relationships between the measures of infertility and key background variables: age, ethnicity, and religious identification. Because the outcomes (infertility) are dichotomous, logistic regression is employed.

3.4 Results

3.4.1 Descriptives

Table 3.3 provides descriptive statistics for the Cape Coast data set. Respondents are aged between 15 and 50, with a mean age of 32.33. Mean age at first marriage (19.47) is on par with national statistics—according to the Demographic and Health Surveys (2011) for Ghana, median age at first marriage was 19.1 in

Table 3.3. Descriptive Statistics for Cape Coast Data

	Mean	St. Dev	Min	Max
Age	32.33	8.63	15	50
Age at First Marriage	19.47	3.33	10	31
<i>Ethnicity</i>				
Adangbe	0.16	0.37	0	1
Ga or Ewe	0.11	0.31	0	1
Denkyira	0.13	0.33	0	1
Fante	0.51	0.50	0	1
Ahanta or Other	0.10	0.30	0	1
<i>Marital Status</i>				
Married	0.62	0.48	0	1
Single	0.12	0.33	0	1
In a Union	0.15	0.35	0	1
Separated	0.03	0.18	0	1
Divorced	0.05	0.22	0	1
Widowed	0.02	0.15	0	1
<i>Education Level</i>				
No Education	0.36	0.48	0	1
Some Primary School	0.18	0.39	0	1
Finished Primary School	0.06	0.24	0	1
Attended Middle School	0.36	0.48	0	1
Attended Secondary School	0.04	0.19	0	1
Scale of Household Goods	2.95	2.13	0	9
<i>Religious Affiliation</i>				
Catholic	0.15	0.36	0	1
Protestant	0.19	0.39	0	1
Moslem	0.22	0.42	0	1
Pentecostal or Charismatic	0.13	0.34	0	1
Syncretic, Traditional, or Other	0.22	0.41	0	1
None	0.08	0.27	0	1
Desire Additional Children	0.57	0.50	0	1
Using Any Birth Control	0.65	0.48	0	1
Using Western Birth Control	0.57	0.50	0	1
Parity	3.53	2.90	0	14
<i>Time to Pregnancy</i>				
Quick	0.36	0.48	0	1
Takes a Long Time	0.32	0.47	0	1
Impossible	0.06	0.24	0	1
Don't Know	0.26	0.44	0	1

N=1,350; pooled N=10,800

1998. In terms of ethnic identification, a majority (51%) of the sample is Fante. An additional 16% are Adangbe, 11% are Ga or Ewe, 13% are Denkyira, and 10%

identify as Ahanta or with some other ethnic group. Over 60% of the sample is married, and an additional 15% are involved in a non-marital union. Twelve percent are never-married, while the remaining 10% are either separated, divorced, or widowed. More than a third of the sample (36%) has never attended school, while 18% have attended but never finished primary school and 6% have completed primary school only. Approximately another third (36%) have attended or completed primary school. Only 4% have attended or completed secondary education.

On the whole, respondents in the sample do not appear to be very wealthy. A scale indicating ownership of some basic durable household goods (such as a mattress, a bicycle, etc) suggests that, on average, respondents only own three of the nine items in the scale. Most respondents identify with a religious group; only 8% report no religious affiliation at all. Nearly a quarter of the sample identifies as Moslem (22%), and an equal percent identify with a syncretic, traditional, or other religion. Just under 20% identify as Protestant (19%), while 15% are Catholic, and the remaining 13% are Pentecostal or Charismatic.

Table 3.3 also provides descriptives for variables relating to fertility preferences and behaviors. Fifty-seven percent of respondents report wanting a child or additional children. However, birth control use is high in the sample—higher than national statistics would suggest should be expected. According to the Demographic and Health Survey (2011) for 1998, only 22% of married women were using any form of contraceptives, and 13.3% were using a western method. While the figures for contraceptive use in the Cape Coast data include not only married women, but also unmarried women (who would conceivably have greater motivation to use contraceptives), these figures are still surprisingly high: 65% of women report using any method of birth control, and 57% report using a western method. Parity, however, at an average of 3.53 children, is fairly close to what might be expected based on the TFR for Ghana.

Finally, time to pregnancy, used to determine self-identification in the sample, is provided in Table 3.3. Thirty-six percent of the sample reported that they become pregnancy quickly—in other words, just over one third of the sample did not self-identify as infertile. Thirty-two percent, or nearly another third of respondents, said that it takes a long time for them to become pregnant, while only 6% say that it is impossible. An additional 26% responded "don't know" to this question, and

Table 3.4. Proportion Infertile Across Waves (N=1,350)

	W 1	W 2	W 3	W 4	W 5	W 6	W 7	W 8
Basic Clinical	0.63	0.67	0.67	0.65	0.73	0.74	0.73	0.69
Standard Clinical	0.12	0.10	0.11	0.11	0.13	0.14	0.13	0.14
Western Clinical	0.16	0.12	0.13	0.14	0.16	0.17	0.18	0.17
Basic Epidemiological	0.52	0.52	0.52	0.47	0.54	0.54	0.60	0.64
Standard Epidemiological	0.09	0.06	0.07	0.06	0.08	0.10	0.10	0.13
Western Epidemiological	0.12	0.08	0.08	0.08	0.11	0.12	0.13	0.15
Basic Demographic 5 Year	0.27	0.27	0.27	0.26	0.29	0.27	0.29	0.35
Standard Demographic 5 Year	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.06
Western Demographic 5 Year	0.05	0.02	0.03	0.03	0.04	0.04	0.04	0.07
Basic Demographic 7 Year	0.19	0.19	0.20	0.19	0.20	0.19	0.21	0.24
Standard Demographic 7 Year	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.03
Western Demographic 7 Year	0.03	0.01	0.01	0.02	0.02	0.02	0.03	0.04
Basic Self-Identified	0.66	–	–	–	–	0.66	0.60	0.65
Standard Self-Identified	0.17	–	–	–	–	0.15	0.11	0.18
Western Self-Identified	0.20	–	–	–	–	0.18	0.15	0.20

were coded as infertile.

Table 3.4 provides the proportion infertile identified by each measure across waves. Basic (not accounting for any form of birth control), standard (controlling for all birth control), and western (controlling for only western birth control use) versions of the clinical, epidemiological, demographic, and self-identified measures are presented. The objective measures follow the pattern expected given definitional differences in waiting times to pregnancy—that is, more women are identified as infertile by a clinical measure than by the epidemiological and demographic measures. Unsurprisingly, the proportion identified as infertile by the basic measures of infertility are substantially higher than those controlling for the various forms of contraceptive use.

Also as expected, proportions infertile are higher for measures which control only for western methods of birth control as compared to measures which control for all methods of birth control, reflecting the fact that the western measures are less stringent than the measures which account for all contraceptive use. With some minor exceptions (including some declines from wave 1, to be addressed shortly), infertility appears to increase across waves, likely as a result of the aging of the women in the study across waves.

It is worth noting that there is substantial variation in the estimates of infertili-

ity across measures. The highest estimate, given by the basic clinical measure in wave 6, identifies nearly three quarters of the sample (.74) as infertile; meanwhile, the lowest estimate, given by the demographic 7 year measure (either standard or western, in multiple waves), identifies only 1% of the sample as infertile. A large portion of this variation can be accounted for by eliminating successful contraceptors from the pool of at-risk women: when we consider only the measures which exclude women who are using contraceptives, the highest proportion identified as infertile drops from .74 to .20 (Western self-identified, waves 1 and 8). The highest proportion estimated infertile by an objective measure accounting for birth control use is .18, which is only slightly lower than the proportion identified by the subjective measure.

This issue speaks to the importance of removing women who are currently contracepting from the risk pool and, more broadly, to the importance of understanding the reproductive behaviors surrounding times to conception. For a woman who desires to have a child, 1 year of unprotected intercourse without conception may signal underlying fertility barriers; for a woman who does not wish to conceive, a year without a conception is not problematic. Thus, objective measures, which rely primarily on a pregnancy history and calendar of contraceptive use, may not adequately account for differences in reproductive desires and behaviors.

The second factor which accounts for the wide variation in estimates of infertility between measures is waiting time to conception. Short waiting times to conception may reflect subfecundity rather than sterility; couples may still conceive naturally beyond the 1 year mark (Larsen 2005). For clinicians, who aim to provide treatment and help subfecund and sterile couples to conceive, early identification of the problem is key. For demographers, however, the emphasis is on identifying the true underlying biological capacity to carry a child to term within the population. Longer waiting times are thus more appropriate for demographers, and the remaining variation between measures once contraceptive use is accounted for is to be expected. For self-identified infertility, personal and local definitions of acceptable waiting times are likely to influence identification as infertile; the amount of variance between subjective and objective measures is partially dependent on these local notions. In sum, both waiting times (objectively or subjectively identified) and contraceptive use strongly influence the proportion of women iden-

tified as infertile by various measures of infertility. The wide variety of estimates provided in Table 3.4 is a function of both of these key factors.

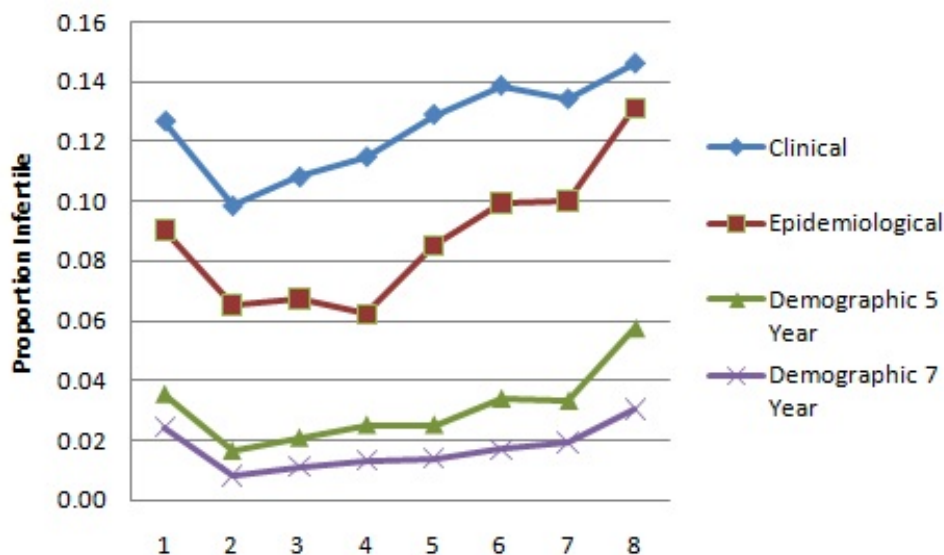


Figure 3.3. Standard Infertility Across Waves

Figure 3.3 shows the proportion of women identified as infertile by standard versions of each of the four objective measures of infertility. In keeping with the patterns observed in Table 3.4, clinical infertility, which requires the shortest waiting time, is the most prevalent form of infertility; by wave 8, slightly more than 14% of women were identified as infertile by a clinical measure. Epidemiological infertility is lower than clinical infertility, but still substantially higher than the demographic measures, reflecting that it is the measure with the next shortest waiting time to infertility. Identification as infertile by the 5 and 7 year demographic measures of infertility is less common, with the proportion infertile as low as around 1% in wave 2.

Also in keeping with the patterns suggested by Table 3.4, infertility appears to increase fairly steadily over time, with the exception of wave 1. The slightly sharper increase in infertility observable in wave 8 as compared to the somewhat more steady rates of increase in previous waves may reflect women who are pregnant but do not yet realize it. In other words, if a woman is four days pregnant at wave 8, she is unlikely to know that she is pregnant, and will thus report that she is

not. Had an additional wave of data been collected, a woman who discovered her pregnancy a week after the wave 8 interview would have been able to retrospectively identify herself as pregnant at that time.

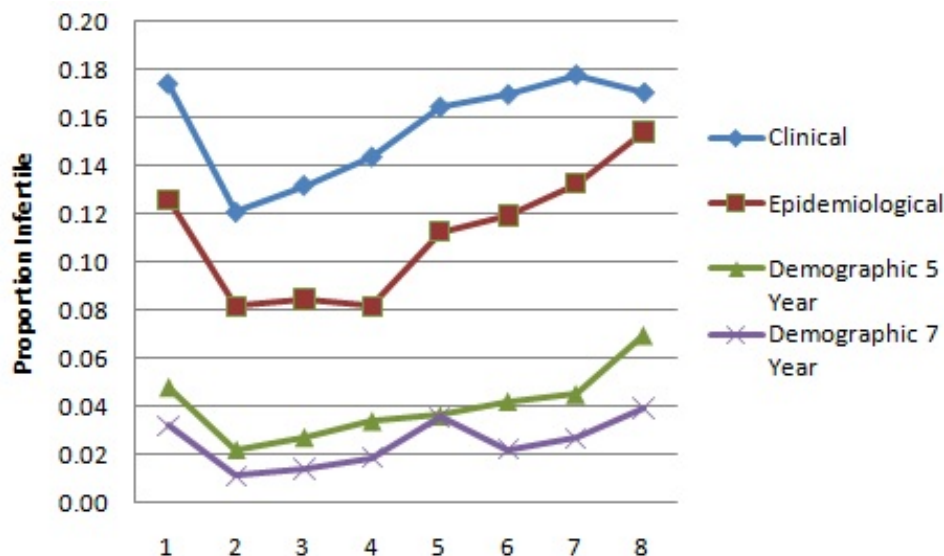


Figure 3.4. Western Infertility Across Waves

Figure 3.4 provides the proportions of infertile women identified by the western versions of the objective measures across 8 waves of data. The general patterns of greater prevalence with shorter waiting times and increases in infertility over time observed for standard measures still hold. However, proportions infertile are higher overall, reflecting that the western measures are less stringent. Interestingly, for the clinical measure, there is a decline rather than increase in infertility from wave 7 to wave 8. The decline in infertility in wave 8 as compared to the trends in Figure 3.3 suggest that many of the women who were identified as infertile by the measure which considers all methods of birth control were, in fact, using traditional methods of birth control to prevent pregnancy. Whether these traditional methods were successful or whether these women are, in fact, infertile is less clear.

In Figure 3.5, we see that combined self-identification is, unsurprisingly, subject to substantial variation: self-identified infertility is nearly identical to clinical infertility in wave 6, to epidemiological infertility in wave 7, and it actually exceeds clinical infertility in wave 8.

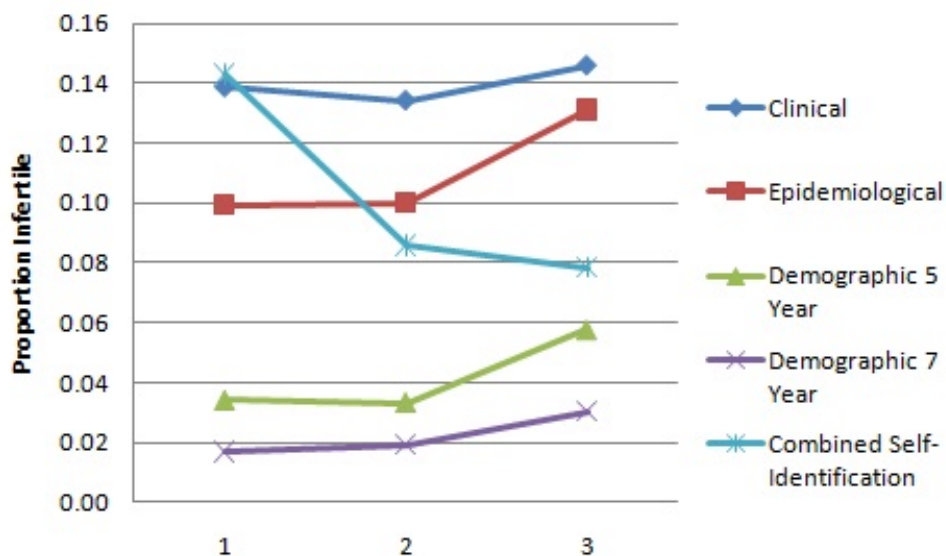


Figure 3.5. Standard Infertility Across Waves 6-8, Including Self-Identification

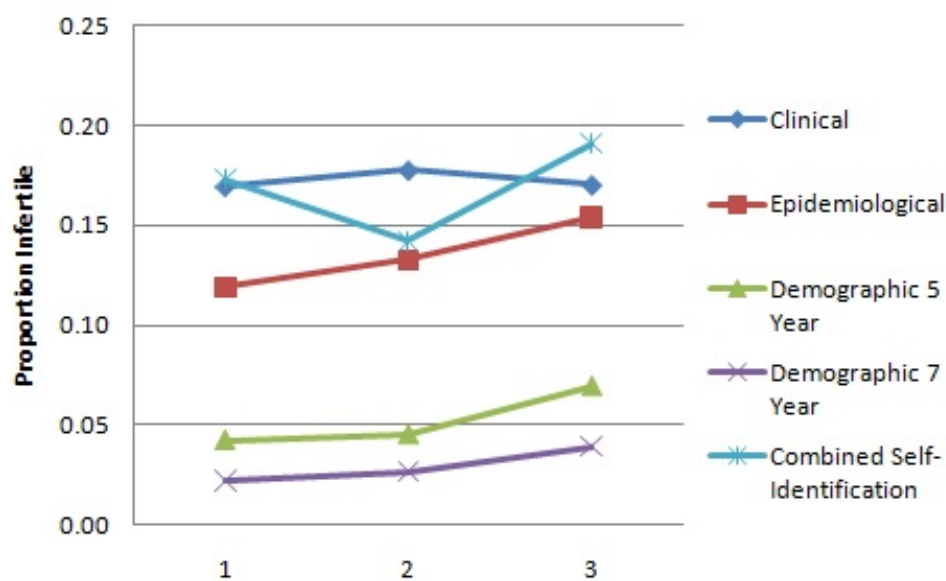


Figure 3.6. Western Infertility Across Waves 6-8, Self-Identification Included

As in Figure 3.5, trends in combined self-identification are provided in Figure 3.6; however, only western measures are presented in this graph. While the actual proportion self-identifying as infertile is quite a bit higher, the trend remains quite

similar when only western methods are considered. Taken as a whole, the trends in Figures C.1 through 3.5 imply that the long waiting times required by demographic measures of infertility may be too conservative to fit with women's own assessments of their infertility.

3.4.2 *Correlations of Measures*

For the sake of parsimony, tables for correlations of measures against themselves across waves are limited to the clinical, demographic 7 year, and self-identified infertility measures. Tables for epidemiological and demographic 5 year infertility are provided in Appendix C. Results for epidemiological infertility are very similar to clinical results, while demographic 5 and 7 year results closely approximate one another. Thus, presenting clinical and demographic 7 year results provides both a range of measures (the most and least stringent) and a set of measures that is similar to the excluded tables.

Based on the tables and figures presented in the previous section, it is clear that the infertility figures in wave 1 are slightly inflated when compared to the frequencies across subsequent waves. An examination of the association between the basic measure of infertility and birth control use suggests that this may be a function of the measurement of birth control use. Specifically, while detailed monthly calendar data are available from the first interview through the final interview, birth control use prior to the first wave cannot be accounted for; infertility measures in waves 2 through 8 can control for birth control use more accurately than can be accomplished in wave 1.

For example, if a woman had a child two years before the first interview date and has been contracepting since, she should be classified as a successful contraceptive, and thus not infertile. If she were still contracepting at the first interview, she would accurately be coded 0 on the measures of objective measures of infertility. If, however, she stopped taking contraceptives in the month prior to the first interview, she would be classified as infertile because her birth control use prior to the first wave would be unknown. Table 3.5 demonstrates the importance of controlling for birth control use in constructing measures of infertility. The correlation of one of the basic biomedical measures (clinical), a basic demographic measure (7 year),

Table 3.5. Correlation of Basic Clinical Infertility and Basic Demographic 7 Year Infertility with Birth Control Use

	BC Use W1	BC Use W2	BC Use W3	BC Use W4	BC Use W5	BC Use W6	BC Use W7	BC Use W8
Clinical Infert. W1	0.21 ***	0.12 ***	0.06 ***	0.02	0.04	0.03	0.04	-0.01
Clinical Infert. W2	0.18 ***	0.27 ***	0.13 ***	0.07 **	0.07	0.03	0.04	0.02
Clinical Infert. W3	0.05	0.24 ***	0.20 ***	0.16 ***	0.12 **	0.04	-0.01	0.05
Clinical Infert. W4	0.03	0.20 ***	0.18 ***	0.21 ***	0.15 ***	0.05	-0.01	0.05
Clinical Infert. W5	0.08 *	0.07 *	0.10 **	0.18 ***	0.21 ***	0.12 **	0.06	0.05
Clinical Infert. W6	0.08 *	0.05	0.03	0.06	0.13 **	0.17 ***	0.13 **	0.05
Clinical Infert. W7	0.05	0.06	0.04	0.01	0.05	0.11 *	0.17 ***	0.07
Clinical Infert. W8	0.06	0.10	0.09	0.05	0.09	0.04	0.06	0.18 ***
7 Year Infert. W1	0.14 *	0.19 ***	0.16 ***	0.14 **	0.12 **	0.11 **	0.08	0.05
7 Year Infert. W2	0.17 **	0.21 ***	0.18 ***	0.16 ***	0.14 ***	0.12 **	0.09	0.06
7 Year Infert. W3	0.19 ***	0.23 ***	0.20 ***	0.18 ***	0.16 ***	0.13 ***	0.09 *	0.07
7 Year Infert. W4	0.19 ***	0.23 ***	0.20 ***	0.18 ***	0.16 ***	0.13 ***	0.09 *	0.07
7 Year Infert. W5	0.21 ***	0.24 ***	0.21 ***	0.18 ***	0.18 ***	0.13 ***	0.08	0.07
7 Year Infert. W6	0.20 ***	0.24 ***	0.21 ***	0.18 ***	0.18 ***	0.15 ***	0.10 *	0.08
7 Year Infert. W7	0.19 ***	0.24 ***	0.22 ***	0.17 ***	0.19 ***	0.14 ***	0.11 *	0.10
7 Year Infert. W8	0.21 ***	0.27 ***	0.23 ***	0.19 ***	0.21 ***	0.15 ***	0.13 **	0.12

Notes: *p < .05; **p < .01; ***p < .001

and birth control use are provided across waves. Within waves, infertility and birth control use are positively, significantly associated. This suggests that a significant portion of women who are classified as infertile by the basic measure are, in fact, successful contraceptors.

Table 3.6 provides correlations between the basic measure of self-identification and birth control use for the four waves for which the self-identified infertility measures are available. There is a weak, sometimes significant positive correlation between self-identified infertility and birth control use across waves; some women who self-identify still appear to use contraceptives. Given that this is a subjective measure, it is perhaps surprising that there are not significant negative correlations between self-identification and birth control use, as it might be expected that a woman who believes she is infertile would be less likely to attempt to prevent a pregnancy. It is important to recognize, however, that some forms of contraceptives (particularly condoms) may be used for purposes other than pregnancy prevention—particularly in the context of targeted efforts to increase condom use for the sake of HIV prevention across the sub-continent (Desgrees du Lou 1999). Additionally, some research suggests that women who have suffered difficult pregnancy histories (for example, having a history of miscarriages) may desire to have more children, but may actively use contraceptives in order to allow their bodies to heal in order to sustain a future pregnancy (Bledsoe 2002).

Moreover, though weak and mostly non-significant, the positive correlation between birth control use and self-identification may partially be due to cultural notions which suggest that giving the body breaks from childbearing in the short-term may have positive effects for long-term childbearing trajectories (Bledsoe 2002). In addition, this relationship may be a function of the imprecision of the self-identification variable in the Cape Coast data. Specifically, rather than explicitly asking whether women believe they are infertile, the question asks whether they become pregnant quickly, or whether it takes a long time. Thus, even if a woman believes that it takes her a long time to become pregnant, this may not be problematic for her if she is not in a rush to conceive.

In sum, some women may believe that childbearing is difficult for them, but timing is also an important consideration which influences fertility decisions. Women may take contraceptives to prevent a mistimed birth even if they believe there is an

Table 3.6. Correlation of Basic Self-Identified Infertility and Birth Control Use

	Infert. W 1	Infert. W 6	Infert. W 7	Infert. W 8	BC Use W 1	BC Use W 6	BC Use W 7	BC Use W 8
Infert. W1	1.00	—	—	—	—	—	—	—
Infert. W6	0.27 ***	1.00	—	—	—	—	—	—
Infert. W7	0.28 ***	0.50 ***	1.00	—	—	—	—	—
Infert. W8	0.23 ***	0.49 ***	0.48 ***	1.00	—	—	—	—
BC Use W1	0.01	0.14 ***	0.12 ***	0.14 ***	1.00	—	—	—
BC Use W6	0.06	0.02	0.06	0.08 *	0.18 **	1.00	—	—
BC Use W7	0.04	0.01	0.03	-0.01	0.15 **	0.44 ***	1.00	—
BC Use W8	0.04	0.05	0.01	-0.04	0.08	0.25 ***	0.29 ***	1.00

Notes: *p < .05; **p < .01; ***p < .001

underlying physical problem increasing the difficulty of conception. Identification as infertile, then, does not necessarily imply that one must currently be trying to conceive. Taken together, the positive correlations between birth control use and infertility seen in Tables 3.5 and 3.6 suggest that it is important to account for birth control use to avoid false positives in the case of successful contraceptors.

Table 3.7 shows the correlation of clinical infertility across waves. Below the diagonal are correlations of standard clinical infertility with itself; correlations for western clinical infertility are provided above the diagonal. Correlations range from weak to moderate, with correlations between proximate waves being greater than those between waves which are further apart. In other words, as time between measures increases, the magnitude of the correlations decreases. Associations between infertility in wave 1 and subsequent waves are the weakest correlations, likely due to the inflated frequencies discussed above. The highest correlation across waves is .47, which is weaker than might be expected given that the measures should be tapping the same underlying infertility factor. There appears to be fairly substantial variation in in who is identified as infertile from wave to wave, then, likely as a result of the short waiting times involved in this measure of infertility. While there are some very slight fluctuations between correlations from the western birth control measure and the standard infertility measure, type of contraceptives controlled for does not appear to make a large difference in the association across waves.

Correlations between epidemiological measures of infertility across waves are provided in Appendix C in Table C.1, with the standard measures below the diagonal and the western measures above the diagonal. Again, correlations are highly significant, but in the weak to moderate range. As with the clinical measure, correlations with the first wave of the epidemiological measure are the lowest. Also in keeping with the trends observed for the clinical measures, correlations are higher among proximate waves than among those more temporally distal. When comparing correlations of standard and western measures, the disparities are slightly greater than those observed for the clinical measures. However, correlations are not consistently higher for one measure over another: on average, in earlier waves, correlations among western measures are higher; in later waves, correlations among standard measures are higher. On the whole, correlations for one type of measure

Table 3.7. Correlation of Standard Clinical Infertility Below the Diagonal, Western Clinical Infertility Above the Diagonal

	Infert. W 1	Infert. W 2	Infert. W 3	Infert. W 4	Infert. W 5	Infert. W 6	Infert. W 7	Infert. W 8
Infert. W 1	–	0.21 ***	0.17 ***	0.14 ***	0.15 ***	0.11 *	0.12 **	0.06
Infert. W 2	0.15 ***	–	0.31 ***	0.22 ***	0.16 ***	0.14 **	0.10 **	0.12
Infert. W 3	0.13 ***	0.31 ***	–	0.47 ***	0.28 ***	0.19 ***	0.20 ***	0.16 **
Infert. W 4	0.13 ***	0.20 ***	0.46 ***	–	0.41 ***	0.21 ***	0.22 ***	0.21 ***
Infert. W 5	0.13 ***	0.17 ***	0.27 ***	0.41 ***	–	0.35 ***	0.19 ***	0.16 ***
Infert. W 6	0.11 **	0.14 ***	0.20 ***	0.21 ***	0.37 ***	–	0.31 ***	0.21 ***
Infert. W 7	0.09 **	0.11 **	0.20 ***	0.20 ***	0.18 ***	0.34 ***	–	0.30 ***
Infert. W 8	0.06	0.11 *	0.14 ***	0.20 ***	0.16 ***	0.20 ***	0.30 ***	–

Notes: *p < .05; **p < .01; ***p < .001

are not systematically higher than the other, suggesting that controlling for western versus all birth control does not substantially increase the magnitude of the correlations.

Tables C.1 (in Appendix C) and 3.8 provide correlations within measures across waves for the demographic 5 year and 7 year measures. Standard measures are provided below the diagonal, while western measures are shown above the diagonal. As with the other measures, correlations with wave 1 are the lowest across waves, while correlations are higher between waves that are closer together in time than among waves which are more distant. Correlations are generally positive and statistically significant, with strength ranging from weak to moderate. The correlations fluctuate based on the forms of contraception accounted for, but not in a systematic way.

The final set of correlations within measures is provided in Table 3.9. Correlations between self-identified infertility across waves 1, 6, 7, and 8 (the four waves for which the measures are available) are provided, with standard measures shown below the diagonal and western measures above the diagonal. The correlations are positive and significant across waves. Correlations are substantially higher among measures in waves 6 through 8 than with wave 1, though the correlations are generally fairly low compared to those observed among other measures. For instance, while the highest correlation among clinical measures is .47, the highest correlation among self-identification is .30. As with the other measures, controlling for more or less stringent measures of birth control use does have an impact on the magnitude of correlations, but not in a systematic way.

The final set of correlations is provided in Tables 3.10. The table provides correlations between all of the measures of infertility, with data pooled across the 8 waves (or in the case of self-identification measures, 4). Correlations are moderate to strong, positive, and generally highly statistically significant. Unsurprisingly, the highest correlations are between measures controlling for all forms of birth control and their less stringent western method counterparts. Among objective measures, correlations are highest among measures which are more similar in terms of waiting times. For example, the correlation between clinical and epidemiological infertility, accounting for all birth control, is .86—nearly as high as the correlation between clinical infertility and its western contraceptive counterpart.

Table 3.8. Correlation of Standard Demographic 7 Year Infertility Below the Diagonal, Western Demographic 7 Year Infertility Above the Diagonal

	Infert. W 1	Infert. W 2	Infert. W 3	Infert. W 4	Infert. W 5	Infert. W 6	Infert. W 7	Infert. W 8
Infert. W 1	–	0.23 *	0.16 *	0.18 ***	0.14 *	0.13 *	0.14 *	0.08
Infert. W 2	0.24 *	–	0.26 **	0.21 *	0.14	0.14 *	0.13 **	0.10
Infert. W 3	0.16 *	0.29 **	–	0.45 **	0.32 ***	0.24 **	0.19 ***	0.16 **
Infert. W 4	0.19 **	0.25 **	0.43 **	–	0.31 **	0.24 ***	0.19 **	0.18 **
Infert. W 5	0.11	0.16 **	0.28 ***	0.31 ***	–	0.39 *	0.27 ***	0.19 **
Infert. W 6	0.16 *	0.18 **	0.26 **	0.22 *	0.33 ***	–	0.38 ***	0.28 **
Infert. W 7	0.15 *	0.16 *	0.19 **	0.17	0.20 **	0.35 ***	–	0.37 ***
Infert. W 8	0.07	0.12	0.14 *	0.17	0.17 *	0.26 **	0.38 ***	–

Notes: *p < .05; **p < .01; ***p < .001

Table 3.9. Correlation of Standard Self-Identified Infertility Above the Diagonal, Western Self-Identified Infertility Below the Diagonal

	Infert. W 1	Infert. W 6	Infert. W 7	Infert. W 8
Infert. W1	–	0.14 ***	0.18 ***	0.11 **
Infert. W6	0.14 **	–	0.28 ***	0.25 ***
Infert. W7	0.16 ***	0.30 ***	–	0.28 ***
Infert. W8	0.10 *	0.25 ***	0.28 ***	–

Notes: *p < .05; **p < .01; ***p < .001

Meanwhile, the correlation between clinical infertility and the demographic 5 and 7 year measures are much lower, at .52 and .38 respectively. Between the demographic measures, the correlation is lower than between the biomedical measures, but still high at .75. This may result from the fact that the difference in waiting times between clinical and epidemiological measures is only 12 months, whereas the difference between demographic measures is 24 months. Type of birth control accounted for appears to make little difference in the relationship between measures; the trends across western measures closely resemble the trends across the more stringent measures. Self-identification appears to be most closely aligned with the clinical measure of infertility, followed by epidemiological, demographic 5 year, and, finally, demographic 7 year measures; self-identification is positively associated with the objective measures, though the association with the demographic 7 year measure is non-significant.

3.4.3 *Test-Retest Models*

Table 3.11 provides results for the test-retest model. This model assumes that subfecundity is an underlying trait captured to a varying extent by each of the measures of infertility outlined above. Based on the logic that the least stringent biomedical model, most stringent demographic measure, and the subjective measure will approximately capture the range of subfecundity (discussed in greater detail above), the test-retest models include measures of latent infertility in waves 6, 7, and 8 as a function of clinical, demographic, and self-identified infertility. The model examines waves 6, 7, and 8 only due to data availability for self-identification measures.

Table 3.10. Correlation Of All Measures of Infertility Across All Waves

	West.			West.			West.			West.		
	Clinical	Clinical	Epi	Epi	Dem	Dem	Dem	Dem	Dem	Dem	Dem	Self ID
Clinical	1.00	-	-	-	-	-	-	-	-	-	-	-
West. Clinical	0.87 ***	1.00	-	-	-	-	-	-	-	-	-	-
Epi	0.86 ***	0.75 ***	1.00	-	-	-	-	-	-	-	-	-
West. Epi	0.75 ***	0.86 ***	0.88 ***	1.00	-	-	-	-	-	-	-	-
Demographic 5 Year	0.52 ***	0.45 ***	0.60 ***	0.52 ***	1.00	-	-	-	-	-	-	-
West. Demographic 5 Year	0.44 ***	0.51 ***	0.51 ***	0.59 ***	0.88 ***	1.00	-	-	-	-	-	-
Demographic 7 Year	0.38 ***	0.33 ***	0.45 ***	0.39 ***	0.75 ***	0.66 ***	1.00	-	-	-	-	-
West. Demographic 7 Year	0.32 **	0.38 ***	0.37 **	0.45 ***	0.64 **	0.76 ***	0.87 **	1.00	-	-	-	-
Self-Identified	0.61 *	0.51 *	0.55 *	0.46 *	0.36 *	0.30	0.28	0.23	1.00	-	-	-
West. Self-Identified	0.53 *	0.60 *	0.48 *	0.54 *	0.32	0.35	0.25	0.28	0.89 ***	1.00	-	-

Notes: *p < .05; **p < .01; ***p < .001

Table 3.11. Test-Retest Model for Clinical, Demographic 7 Year, and Self-Identified Infertility

	B		St. Error
<i>Latent Infertility W6</i>	–		–
Clinical	1.01		0.03
Demographic	0.88	***	0.03
Self-Identified	0.86	***	0.03
<i>Latent Infertility W7</i>	–		–
Clinical	1.01		0.04
Demographic	0.88	***	0.04
Self-Identified	0.86	***	0.04
<i>Latent Infertility W8</i>	–		–
Clinical	1.02		0.03
Demographic	0.90	***	0.03
Self-Identified	0.88	***	0.04
Latent Infertility W6 on W7	0.57	***	0.06
Latent Infertility W7 on W8	0.58	***	0.06
Correlation of Errors of Clinical W6 and W7	0.01		0.06
Correlation of Errors of Clinical W6 and W8	0.05		0.06
Correlation of Errors of Clinical W7 and W8	-0.06		0.06
Correlation of Errors of Demographic W6 and W7	0.32	***	0.08
Correlation of Errors of Demographic W6 and W8	0.41	***	0.11
Correlation of Errors of Demographic W7 and W8	0.36	***	0.06
Correlation of Errors of Self-ID W6 and W7	0.10		0.07
Correlation of Errors of Self-ID W6 and W8	0.19	***	0.06
Correlation of Errors of Self-ID W7 and W8	0.06		0.07

Notes: *p < .05; **p < .01; ***p < .001; RMSEA=.027

Model fit statistics were obtained for a series of test-retest models involving a variety of theoretically motivated constraints. Specifically, model fit, measured by the Root Mean Square Error of Approximation (RMSEA), was examined for the following models: a) All errors were uncorrelated, and no paths were constrained to be equal across waves, b) errors for each measure between waves 6 and 7, and waves 7 and 8 are correlated, c) errors for each measure between waves 6 and 7, 6 and 8, and 7 and 8 are all correlated, d) errors were uncorrelated, but paths for each measure were constrained to be equal across waves, e) paths were constrained to be equal and errors were correlated between waves 6 and 7 and waves 7 and 8, and, finally, f) within measures across waves, all errors were correlated, and all paths were constrained to be equal. Based on the model fit statistics, model f was

selected (RMSEA=.027). Results presented are from the standardized models.

Table 3.11 provides the results of the test-retest model. Coefficients within measures across waves have been constrained to equal, and thus do not vary across waves. The coefficients for clinical, demographic 7 year, and self-identified infertility represent the reliability of the measures. Recall, these paths have been constrained to be equal in this model (though there is some very slight variation in the coefficients due to standardization). Perhaps surprisingly, clinical infertility appears to be the most reliable measure of the latent construct, as indicated by the large coefficients for this measure across waves, though the coefficient is not significant. Clinical infertility is followed by the demographic 7 year measure, which is a highly significant indicator of underlying infertility. Reliability is lowest for self-identified infertility, though also significant and only slightly less reliable than the demographic measure.

The paths for the relationship between latent infertility in waves 6 and 7 and waves 7 and 8 represent the stability of the measures across waves. Although these paths were not constrained to be equal, they are remarkably similar, suggesting that the stability between waves 6 and 7 is only marginally lower than the stability between waves 7 and 8. This suggests that the stability of the measures fluctuates very little across time. However, given that these coefficients are only moderate in strength ($B=.57$ and $.58$ respectively), this suggests that stability of the measures is not particularly high across waves. This is somewhat surprising given that once an individual is truly subfecund, it would be unusual for her to once again be fecund in later waves—that is, within person variation in subfecundity could reasonably be expected to be fairly low. The moderate stability of the infertility measures across waves, then, suggests that perhaps current measures of infertility are imperfect indicators of true underlying subfecundity.

Finally, Table 3.11 includes the correlations of errors to capture associations among unmeasured characteristics. While these correlations do not provide information about the reliability or stability of the measures, they do suggest that there is a significant association between the unmeasured characteristics of respondents who are identified as infertile by the demographic measure and, to some extent, by the self-identified infertility, but not those who are clinically infertile. This stands to reason because the information used to identify demographic infertility overlaps

substantially for demographic infertility as a result of the long waiting time; this is less true of self-identified infertility, which does not specify a waiting time, and especially of clinical infertility, which designates a very short waiting time, causing substantial change in identification across time.

3.4.4 *Random Effects Models*

The final analysis examines the relationship between the infertility measures and background characteristics—age, ethnicity, and religious affiliation. Data were pooled across 8 waves, and random effects models were used to account for the non-independence of observations across waves. Zero-order and full models are provided for the basic, standard, and western versions of clinical and demographic 7 year measures, as well as self-identification, uncertainty, and combined self-identity. The logistic regression random effects results are presented as odds ratios (OR's). Based on exploratory analyses, curvilinear terms for age were included in the models when suggested by lowess curves and found to be statistically significant.

Table 3.12 shows the relationship between clinical infertility and background characteristics. Looking first at the zero-order model for basic clinical infertility, there is a statistically significant relationship between age and infertility: for every one year increase in age, there is 9% increase in the odds of identification as infertile. Likewise, ethnicity is significantly associated with infertility. Specifically, Denkyira respondents have greater odds (OR=1.55) of identification as infertile than the reference group (Ahanta or other ethnicity). Though the remaining ethnic groups are not significantly associated with basic clinical infertility compared to the reference group, most have greater odds of identification (Adangbe, with a non-significant negative association, are the exception to this pattern). Religion is also a significant predictor: compared to those who report no religious affiliation, those identifying as Moslem (OR=.72), Syncretic, Traditional, or some other religious affiliation (OR=.77) have lower odds of being infertile. Respondents identifying as Catholic, Protestant, Pentecostal, or Charismatic also had lower odds of infertility, but these findings were non-significant.

The next two columns in Table 3.12 show the coefficients for the full model predicting basic clinical infertility—that is, the model in which age, ethnicity, and

Table 3.12. Random Effects Model of Clinical Infertility and Background Characteristics

	Basic			Basic			Standard			Standard			Western					
	Zero Order			Full Model			Zero Order			Full Model			Zero Order			Full Model		
	OR	St. Error	St.	OR	St. Error	St.	OR	St. Error	St.	OR	St. Error	St.	OR	St. Error	St.	OR	St. Error	St.
Age Squared	1.09	0.00	—	1.09	0.00	—	1.17	0.05	—	1.18	0.05	—	1.17	0.05	—	1.17	0.05	—
Age Squared	—	—	—	—	—	—	.02	0.02	—	.02	0.01	—	.02	0.02	—	.02	0.02	—
<i>Ethnicity</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Adangbe	0.85	0.09	—	0.96	0.13	—	1.26	0.17	—	1.23	0.23	—	1.22	0.18	—	1.21	0.18	—
Ga or Ewe	1.17	0.12	—	1.20	0.14	—	0.97	0.15	—	0.95	0.15	—	1.06	0.17	—	1.04	0.18	—
Denkyira	1.55	0.19	***	1.45	0.18	***	0.97	0.13	—	1.03	0.15	—	1.01	0.13	—	1.07	0.15	—
Fante	1.15	0.10	—	1.06	0.11	—	0.80	0.10	—	0.85	0.11	—	0.88	0.10	—	0.92	0.11	—
Ahanta or Other (reference)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Religious Affiliation</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Catholic	0.95	0.13	—	1.07	0.17	—	1.16	0.23	—	0.97	0.19	—	1.14	0.19	—	0.97	0.18	—
Protestant	0.90	0.12	—	1.05	0.15	—	1.04	0.21	—	0.94	0.18	—	1.05	0.19	—	0.95	0.18	—
Moslem	0.72	0.09	*	1.03	0.18	—	1.29	0.25	—	0.85	0.18	—	1.18	0.21	—	0.82	0.16	—
Pentecostal or Charismatic	0.89	0.12	—	0.98	0.16	—	1.27	0.21	—	1.03	0.17	—	1.21	0.18	—	0.98	0.15	—
Syncretic, Traditional, or Other	0.77	0.09	*	0.89	0.12	—	0.95	0.16	—	0.90	0.15	—	0.95	0.14	—	0.89	0.14	—
None (reference)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
/lnsig2u	—	—	—	0.62	0.01	—	—	—	—	0.04	0.03	—	—	—	—	0.05	0.03	—

Notes: *p < .05; **p < .01; ***p < .001; Age squared divided by 1,000

religious affiliation are all included in the model. The patterns are quite similar to those observed in the zero-order models, though the magnitude of most of the coefficients is somewhat reduced and religious affiliation becomes non-significant, suggesting that some of the effect of religious affiliation is due to the association with ethnicity and age.

The next set of models in Table 3.12 are the zero-order and full models for standard clinical infertility. The magnitude of the association between age and infertility (OR=1.17) is highly significant and greater than the association for basic clinical infertility, but the relationship is curvilinear: contrary to what might be expected, infertility actually increases until around age 30, then begins to decline (discussed further below). The relationship between infertility and ethnicity is not significant in either model, and the coefficients have, in fact, changed directions, suggesting that at least some of the effect of ethnicity was related to birth control practices. Likewise, religion is a non-significant predictor in these models, and the coefficients change direction between the zero-order and full models. The final models in Table 3.12 show the relationship between western clinical infertility and background characteristics. As with standard infertility, the relationship between the western measure and age is highly significant, positive (OR=1.17), and curvilinear. Also as with the standard models, ethnicity and religious affiliation are non-significant in both the zero-order and full western models.

As discussed briefly above, there is a curvilinear relationship between standard and western infertility and age. This relationship speaks to the importance of accounting for birth control use in measures of infertility: the expected strong, positive relationship can be observed between basic infertility and age. Figure C.1 in Appendix C shows a Lowess curve of this relationship. Once birth control is accounted for, the relationship between age and infertility becomes more complex. As can be seen in Figures C.1 and C.1 in Appendix C, the relationship between infertility and standard clinical infertility is strong and positive only until around age 30, at which point it becomes a negative relationship. Thus, while the natural biological increase in subfecundity over time suggested by the literature appears to be supported by the data, this relationship only holds before accounting for birth control. Birth control use, it seems, increases as women age—behavior which could be logically expected: as women age, they are more likely to have achieved their

desired family size (or at least to be closer to goal), and will thus have greater motivation to use contraceptives.

Table 3.13 shows the results for the demographic 7 year measures. First, zero-order and full models are provided for the basic demographic measure. Age is positively, significantly associated with infertility in both models: for every year increase in age, the odds of identification as infertile by the demographic 7 year measure increase by 18%. In terms of ethnicity, the zero-order model shows that Denkyira and Fante respondents are significantly more likely (OR=1.86 and 1.33 respectively) to be demographically infertile than those identifying as Ahanta or another ethnic group. The magnitude of the relationship is reduced in the full model, but the coefficient for Denkyira remains significant. Religion is not significant in the zero-order model, but when it is included in the full model it becomes significant. Specifically, the odds of infertility are 52% higher for Protestant respondents than those who don't identify with any religion.

The models for the standard measures are provided next in Table 3.13. As with the clinical measure, the relationship between age and standard demographic infertility is significant and curvilinear, with infertility increasing until around age 40, then declining slightly thereafter. Lowess curves for the relationship between demographic infertility and age are provided in Figures C.1 through C.1 in Appendix C. Ethnicity is no longer significant (as compared to the models with basic demographic infertility), and religion is significant only in the zero-order model, which shows that the odds of Pentecostal or Charismatic respondents being infertile are 39% lower than the odds for those with no religious affiliation. The last models in Table 3.13 show the models for the western demographic 7 year measure. Patterns in these models are largely the same as those observed in the models for the standard measure, although the magnitude varies (reduced in some cases, increased in others, perhaps reflecting religious and ethnic differences in type of birth control used).

Turning next to the subjective measures, Table 3.14 provides the random effects models for the combined measure of self-identification. In contrast to the other measures, there is a statistically significant curvilinear relationship between the basic combined measure, but not the standard or western combined measures. For the basic measure, infertility declines until around age 30, then begins to

Table 3.13. Random Effects Model of Demographic 7 Year Infertility and Background Characteristics

	Basic			Standard			Standard			Western									
	Zero Order			Zero Order			Full Model			Zero Order			Full Model						
	OR	St. Error	St. Error	OR	St. Error	St. Error	OR	St. Error	St. Error	OR	St. Error	St. Error	OR	St. Error	St. Error				
Age Squared	1.18	***	0.01	1.18	***	0.01	1.36	*	0.13	*	0.13	1.40	*	0.13	1.38	**	0.11	**	0.11
<i>Ethnicity</i>																			
Adangbe	0.95		0.12	1.20		0.25	2.17		0.94		1.65	2.92		1.67	1.67		0.62		2.16
Ga or Ewe	1.22		0.17	1.32		0.23	1.21		0.53		0.50	1.15		1.20	1.20		0.45		1.17
Denkyira	1.86	***	0.32	1.75	*	0.37	1.29		0.62		0.67	1.32		1.29	1.29		0.57		1.29
Fante	1.33	*	0.15	1.28		0.20	0.86		0.39		0.39	0.81		0.96	0.96		0.34		0.91
Abanta or Other (reference)																			
<i>Religious Affiliation</i>																			
Catholic	0.97		0.14	1.25		0.22	0.44		0.21		0.20	0.43		0.60	0.60		0.24		0.59
Protestant	1.14		0.15	1.52	**	0.23	0.67		0.23		0.24	0.71		0.85	0.85		0.25		0.90
Moslem	0.81		0.13	1.38		0.33	0.81		0.29		0.25	0.41		0.79	0.79		0.24		0.53
Pentecostal or Charismatic	0.87		0.13	1.26		0.23	0.61	*	0.24	*	0.22	0.53		0.68	0.68	*	0.21		0.63
Syncretic, Traditional, or Other	0.91		0.15	1.01		0.19	0.36		0.17		0.19	0.38		0.44	0.44		0.16		0.46
None (reference)																			

Notes: *p < .05; **p < .01; ***p < .001; Age squared divided by 1,000

Table 3.14. Random Effects Model of Self-Identified Infertility and Background Characteristics

	Basic			Basic			Standard			Standard			Western			Western				
	Zero Order			Full Model			Zero Order			Full Model			Zero Order			Full Model				
	OR	St. Error		OR	St. Error		OR	St. Error		OR	St. Error		OR	St. Error		OR	St. Error			
Age Squared	0.74	0.02	***	0.74	0.02	***	0.91	0.01	0.91	0.91	0.01	0.91	0.91	0.01	0.91	0.91	0.01	0.91	***	
Age	83.53	37.95	***	88.14	40.20	***	-	-	-	-	-	-	-	-	-	-	-	-	0.01	
<i>Ethnicity</i>																				
Adangbe	0.77	0.10	*	0.79	0.12	-	1.01	0.21	0.89	0.22	0.22	1.02	0.93	0.22	0.93	0.22	0.22	0.23	-	
Ga or Ewe	0.89	0.12		0.88	0.13		0.98	0.18	0.98	0.19	0.19	0.97	0.97	0.17	0.97	0.17	0.17	0.18	0.18	
Denkyira	1.14	0.16		1.16	0.18		0.99	0.20	1.03	0.22	0.22	0.97	1.03	0.17	1.03	0.17	0.17	0.20	0.20	
Fante	1.02	0.11		0.99	0.11		0.75	0.12	0.79	0.13	0.13	0.82	0.86	0.12	0.86	0.12	0.12	0.13	0.13	
Ahanta or Other (reference)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Religious Affiliation</i>																				
Catholic	0.77	0.11		0.74	0.11	*	1.39	0.42	1.10	0.34	0.34	1.37	1.10	0.35	1.10	0.35	0.35	0.29	0.29	
Protestant	1.00	0.14		0.99	0.14		1.25	0.36	1.09	0.33	0.33	1.34	1.17	0.33	1.17	0.33	0.33	0.30	0.30	
Moslem	0.71	0.10	*	0.80	0.14		1.34	0.42	0.97	0.33	0.33	1.33	0.97	0.36	0.97	0.36	0.36	0.28	0.28	
Pentecostal or Charismatic	0.84	0.12		0.88	0.12		1.42	0.36	1.13	0.30	0.30	1.42	1.16	0.31	1.16	0.31	0.31	0.26	0.26	
Syncretic, Traditional, or Other	0.95	0.15		0.96	0.15		1.12	0.29	1.04	0.27	0.27	1.18	1.10	0.27	1.10	0.27	0.27	0.25	0.25	
None (reference)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: *p < .05; **p < .01; ***p < .001; Age squared divided by 1,000

rise steadily thereafter. Figures C.1 and C.1 in Appendix C provide a graphic display of this relationship. Additionally, ethnicity and religious affiliation are significantly associated with basic combined self-identification in the zero-order model. Specifically, Adangbe respondents have lower odds (OR=.77) of identifying as infertile than Ahanta or those identifying with some other ethnic group, while Moslem respondents have lower odds of identifying than those with no religious affiliation. With a few exceptions, the patterns between the zero-order and full model are quite similar. However, the relationship between self-identification and ethnicity is no longer significant. Meanwhile, though the odds ratio for Moslem respondents is no longer significant, Catholic respondents have 36% lower odds of self-identification than those with no religious affiliation.

The next models in 3.14 show the zero-order and full models for standard combined self-identification. The relationship between age and infertility is no longer significant once birth control is accounted for, suggesting that much of the drop in infertility until around age 30 is due to increasing use of birth control during this time period. Additionally, accounting for birth control use reduces the effects of ethnicity and religious affiliation to non-significance, suggesting that much of the relationship between self-identified infertility, ethnicity, and religious affiliation is due contraceptive behavior. Nearly identical results can be observed between the standard and western models.

3.5 Discussion

3.5.1 *Conclusions*

In this chapter, I explored the utility of a variety of biomedical, demographic, and subjective measures of infertility for social research in SSA. While prior studies (Larsen 2000; Larsen 2005; Larsen and Raggars 2001) have examined measurement issues associated with estimating the prevalence of infertility, less is known about which of the plethora of measures available in the literature is most suitable for studying the relationship between infertility and social outcomes. Employing correlation analyses, test-retest models, and random effects models, this chapter attempts to answer that question. I examine clinical (12 month), epidemiologi-

cal (24 month), demographic 5 and 7 year measures, and self-identified infertility (measured both separately from and together with uncertainty). These analyses seek to answer the following: (1) which measure is the most reliable measure of infertility across time, (2) which measure is most closely related to self-identification, and (3) which measures relate to background characteristics in expected ways?

Taken together, the correlation analyses suggest that, while the trends in infertility across time (as women age; Larsen 1994) are fairly similar across the objective measures, longer waiting periods to identification as infertile result in more stringent and, thus, more stable measures, as indicated by the higher correlations among the demographic than biomedical literatures. Moreover, the test-retest model showed that the demographic 7 year measure was the most reliable statistically significant indicator of latent infertility. This provides some support for Larsen's (2005) assertion that biomedical definitions of infertility are not stringent enough to be useful. It is reasonable expect that infertility would increase somewhat across across time as cohorts in the study age and natural fertility declined. Conceptualizing subfecundity as an underlying continuum of the biological capacity to conceive and carry a child to term, we could also expect some fluctuations as women who are somewhat subfecund but not sterile have children, but at a slower than expected rate due to biological factors. These expectations account for the low to moderate correlations observed within measures.

Associations between objective measures with themselves across waves were fairly similar, while those among self-identification were noticeably lower, suggesting that there is greater fluctuation in self-identified measures across time. Across measures, those which involve the most similar waiting times are most highly correlated. In other words, the biomedical measures are very similar to one another, but less similar to the demographic measures, which are highly correlated. Meanwhile, self-identification was most closely aligned with clinical infertility, suggesting that the long waiting times required by demographic measures of infertility may be too conservative to fit with women's own assessments of their infertility.

In terms of the relationship between measures and background characteristics, the random effects models showed that the demographic 7 year measure related to infertility in the most predictable way—that is, rising steadily across time. However, all of the measures were, in fact, related to age, though the majority of these

relationships appear to be curvilinear. Additionally, though there is a relationship between infertility and background characteristics (age, ethnicity, and religious affiliation), only age is consistently related to infertility. The random effects models provided some evidence that the effects of ethnicity and religious affiliation are tied to one another, as well as being closely tied to birth control use. This finding is in keeping with research which suggests that a relationship may exist between infertility and background characteristics as a result of differences in sexual practices associated with ethnicity and religious beliefs (Frank 1983).

The results from this chapter also provided an opportunity to examine the effects of controlling for all forms of contraceptives versus controlling for western methods. The proportions identified as infertile suggest that the western birth control measures are less stringent than the broader measures. However, the correlations revealed little systematic difference between measures controlling for all birth control compared to western methods. Comparing basic measures and measures controlling for contraceptive use reveals that a large proportion of those identified as infertile based purely on waiting times are, in fact, successful contraceptors; accounting for birth control use, then, is important to avoid false positives. Moreover, many of the relationships between basic infertility, ethnicity, and religious affiliation changed magnitude or were reduced to non-significance when birth control use was accounted for, suggesting that much of the relationship between these factors acts through contraceptive use.

Taken as a whole, the results herein suggest that, though useful for estimating the prevalence of biological infertility in a population (Larsen 2005), demographic measures of infertility are too conservative to match with cultural and individual notions of infertility. Arguably, these local notions of infertility may be far more salient for understanding the social implications of infertility. Thus, the clinical measure appears to be the most appropriate objective measure for social research on infertility. However, given the similarities between the clinical and epidemiological (24 month) measures of infertility, epidemiological infertility may serve as a suitable substitute for researchers seeking a more conservative measure. Additionally, the results herein speak to the importance not only of selecting the appropriate waiting time, but also of controlling for contraceptive use. However, the distinction between controlling for western versus all contraceptives made little

difference; controlling for all methods is advisable for a stringent measure.

3.5.2 *Limitations and Directions for Future Research*

While this chapter has provided an extensive exploration of measurement and infertility, there are some limitations to the findings presented herein. First, because the data are based solely on Ghana, the findings cannot be generalized to sub-Saharan Africa more broadly. Future research should focus on extending these findings to other countries and regions in the sub-continent.

It is also worth noting that contraceptive use among women in the Cape Coast sample is higher than might be expected based on demographic estimates for the country. Recall from Chapter 1 that contraceptive use among married women was only 23.5% according to the 2008 Demographic Health Surveys (DHS 2011), while 65% of the Cape Coast sample reports using any contraceptive method. Similarly, while the 2008 DHS shows that 16.6% were using western contraceptives in 2008, 57% report using contraceptives in the Cape Coast data. One might conclude that much of this disparity is due to the fact that the Cape Coast data is not restricted to married women. However, when the sample is restricted to married women, birth control use is still at 65% in the Cape Coast data. Meanwhile, contraceptive use among unmarried women in sexual unions (58.3%) is actually somewhat lower than among married women.

Although the sample was collected in geographically dispersed communities, Casterline (2007) notes that the the sampling frame was purposive in nature—specifically, it was designed to maximize ethnic, economic, kinship, and between-community diversity. This emphasis on diversity of the sample may thus have resulted in selection bias, as evidenced by the inflated birth control use figures. Future research should attempt to replicate the findings from this study using a nationally representative sample.

Additionally, recall that, although a strict definition of clinical and epidemiological infertility focuses on conception rather than live births, the analyses herein focused on births due to the difficulties inherent in measuring conception in survey data. However, a focus on conception rather than birth may produce different results, and is an area that should be explored in future research.

Finally, though this study provided some evidence of the utility of the self-identification measure used in the Cape Coast data, it is unclear how this measure of infertility might compare to other potential subjective measures. A respondent's understanding of the survey item assessing self-identification will impact her response; though she may believe that it takes a long for her to conceive a child, she may not believe that she is currently infertile. Because it is unclear from this survey item *why* women believe it takes a long time or is impossible for them to conceive (i.e. whether their difficulties are due to underlying biological subfecundity or some other cause), it is difficult to assess whether this measure is, in fact, capturing women's own views of whether they are infertile. A different measure may be more appropriate for capturing women's beliefs about their infertility. For instance, the U.S. based National Study of Fertility Barriers includes two questions which assess self-identified infertility: "Do you think you have/have had/might have trouble getting pregnant" and "Do you think you have/have had a fertility problem" (Johnson and White N.D.). Respondents who answered yes to either of these questions were asked to provide additional details as to why they believed they were infertile. Future research should consider a variety of measures of self-identified infertility to assess which is the most valid measure.

The Link Between Infertility and Relationship Stability Among Women in Ghana

4.1 Introduction

Family and demographic research in sub-Saharan Africa (SSA) has long focused on fertility behaviors and desires (for example, Bongaarts et al. 1984). Strong emphasis is placed on the importance of childhood in such pronatalist settings (Geelhoed et al. 2002), and childbearing is an expected part of adult life. More recently, research has begun to explore the causes and consequences of infertility in SSA (see, for example, Mayaud 2001), focusing on estimating prevalence (see, for example, Larsen 1996; Larsen 2000; Larsen and Raggars 2001) and examining such issues as how infertility impacts and is impacted by, among other social factors, psychological distress, marital instability, stigmatization, and the spread of sexually transmitted diseases (Dyer et al.. 2005). Recent evidence suggests that infertility exposes individuals (with disproportionately negative effects for women) to relationship instability in the form of partner infidelity (Boerma and Urassa 2001), marital disharmony (Okonofua 1999), and divorce (Mgalla and Boerma 2001; Leonard 2002).

Despite the expansion of research on the consequences of infertility in SSA,

much remains unknown about the relationship between infertility and many of these social outcomes, including the implications for romantic partnerships. Much of the existing research on the link between infertility and relationship stability in SSA is qualitative or cross-sectional; while these studies provide key evidence that such a link may exist, quantitative longitudinal studies may help to identify whether there is sufficient evidence of a substantively and statistically significant relationship between relationship stability and infertility in SSA. Moreover, the few studies which do examine this issue using quantitative data (see, for example, Boerma and Urassa 2001) tend to focus on marital stability, with less attention paid to the effects of infertility among those who are unmarried but involved in sexual relationships. Given the dearth of quantitative and longitudinal models examining the effects of infertility on the relationship stability for both married and unmarried individuals involved in a sexual union, the current study examines this relationship using 8 waves of panel data collected in Ghana.

4.2 Literature Review

4.2.1 *Relationship Formation and Disruption in Sub-Saharan Africa*

Marriage is a central, nearly universal institution in SSA, providing couples with adult status, a solidary economic resource, and, for many, important ancestral linkages (Aryee 1997). In Ghana, for example, women speak to the importance of marriage, and believe that it is second only to motherhood for providing women with economic status, personal happiness, and companionship (Oppong and Abu 1987). A primary goal of marriage in Ghana is to produce children. Customary marriage rites differ by ethnic group; with these differences come differences in the rights regarding children, property, residence, and sexual relationships. Christian marriages are also common, though they differ from customary marriages primarily in symbolic rather than legal respects. Conversely, a small number of couples (mostly educated elites) enter into a Marriage Ordinance, which is a legally monogamous union providing rights to property for widows and ensuring that divorce is difficult to obtain. Divorce has traditionally been disapproved of in Ghana, but it

is becoming more common—particularly among urbanites (Salm and Falola 2002).

Traditional marriages tended to be early and often polygynous (Aryee 1997). While women see co-wives as reducing the status of any one wife and reducing social and economic rewards of marriage, there also appear to be domestic benefits—primarily in the form of shared responsibility for cooking, laundry, and other domestic tasks (Oppong and Abu 1987). Additionally, there have traditionally been strong norms against premarital intercourse and childbearing; however, marriage norms have been changing in much of SSA (Aryee 1997), and premarital sexual and fertility behavior is on the rise (Zabin and Kiragu 1998). Polygyny is still widely practiced, with the highest rates found in West Africa. The price of the bridewealth and marriage ceremony have both been on the rise in recent years, contributing to a rising age at first marriage. Concomitantly, premarital childbearing and cohabitation have increased, as has the phenomenon of taking “outside wives”—that is, extramarital long-term partners who do not formally enter into a marriage.

In their overview of family life in SSA, Adepoju and Mbugua (1997) discuss the broad patterns often observed in the formation and function of the contemporary African family. The families of the bride and groom typically actively participate in mate selection, bridewealth negotiation and payments, and the rites of marriage. Once the couple marries, they may seek economic and emotional refuge with their extended family networks, and the natal family continues to play an important role in the lives of the couple. Childbirth is expected to begin very soon after marriage (and stop when the first grandchild is born); the main role of female spouses is seen to be bearing and raising children. Women expect to begin childbearing immediately after marriage, and motherhood earns women higher social status; the first birth is associated with the transition to adult status (Oppong and Abu 1987). Discussing their qualitative data from women in Ghana, Oppong and Abu (1987) note:

Marriage and procreation are intimately bound together in the consciousness of the women interviewed. Frequently they said that the whole point of marriage is to have children and for the man to maintain the children. Thus marriage is frequently seen as not only supportive of procreation but secondary to it (p. 77).

In Botswana, for instance, women are socialized from childhood that they should get married and start a family; being a woman is tied to being a mother (Mogobe 2005). Where bridewealth is still commonplace, the payments may be seen as an investment in a fertile woman who will continue the family lineage; if the couple does not produce a child, the woman may be seen as being unable to fulfill her primary role as a wife, and, in some settings, repayment of the bridewealth to the male spouse's family may be demanded (Aryee 1997). In fact, the bridewealth may be conceived of as a means of transferring a woman's reproductive capacity from the woman's family to that of her soon-to-be husband (Armstrong 1997). While the manifest function of the bridewealth is to tie two families together, one latent function is to facilitate divorce when a woman does not fulfill her reproductive responsibilities.

Although studies of marital stability have tended to focus primarily on developed countries such as the United States, increasing attention has been paid to divorce in SSA in recent years (Takyi and Broughton 2006). While obtaining precise, accurate estimates of divorce is difficult due to data limitations, it appears that, though lower than in the United States, is still quite high; estimates range between 25% and 60% depending on the particular demographic group under consideration. Given the lack of a strong social welfare system in SSA, divorce is likely to be even more detrimental to the well-being of women and children than in Western contexts.

Divorce in SSA is an increasingly common phenomenon (Salm and Falola 2002); however, because marriage is considered a tie not between two individuals, but between two families (Takyi 2003), a formal divorce is not necessarily indicative of severance of family ties (Armstrong 1997). In patrilineal settings, for example, a divorced woman may lose legal rights associated with marriage, such as custody of her children, but may still be expected to mourn as a wife if her ex-husband should die (Armstrong 1997). Similarly, she may be expected to remain socially connected to her ex-husband's family. Thus, though divorce may mark the end legal rights to support, the social obligations which form in marriage may remain. Generally reasons for divorce are limited, and vary somewhat by gender (Salm and Falola 2002). For men, legitimate reasons for divorce include infertility, infidelity, desertion, and spousal practice of witchcraft; for women, a husband's impotence,

desertion, or cruelty may justify divorce. However, adultery is often not seen as legitimate grounds for divorce.

The complexity of marriage and divorce in SSA is even greater when polygyny is considered. Findings on polygyny and relationship quality and stability have been mixed. As previously discussed, polygyny is still widely practiced—particularly in West Africa. Although nearly 70% of marriages are not polygynous, men may have outside partners who they do not marry, often times due to the high financial costs of supporting more than one wife (Salm and Falola 2002). While some studies have posited that polygyny may empower women, both by providing them with the autonomy to run their own households and through the availability of cowives to watch children and assist in economic activities (Oppong 1997), others have pointed to the negative outcomes associated with polygyny (Aryee 1997). Takyi and Broughton (2006) note that female empowerment may be associated with increased relationship instability as women are more capable of leaving relationships. Within the reproductive realm, Caldwell and colleagues (Caldwell et al. 1992) point out that in West and Central Africa, polygyny is often associated with separate household budgets, which may leave the costs of childbearing and childrearing placed squarely on the shoulders of women, while the bridewealth ensures that men maintain the rights to make reproductive decisions. However, Doodoo (1998) assesses decision making in monogamous and polygynous unions in Ghana and Kenya and finds that women actually have a greater influence over the couple's reproductive choices in polygynous marriages than in monogamous marriages. Meanwhile, Desgrees du Lou (1999) notes that polygyny increases the number of male multiple partnerships and, thereby, the risk of HIV infection among wives. Conversely, Salm and Falola (2002) note that because of sex ratio imbalances, polygyny may allow women who might otherwise remain single to marry and, thus, protect them from the stigma associated with remaining unmarried. It is unclear what the impact of these positive and negative consequences of polygyny may be for marital stability.

Given the limited number of studies on divorce in SSA (Takyi and Broughton 2006), research on marital quality and stability from the U.S. provides a few additional insights into the likely correlates of divorce. For instance, Huber and Spitze (1980) focus on predictors of thoughts of divorce, and find that such thoughts de-

crease with increased marital duration. Similarly, Amato and Rogers (1997) find that, for some kinds of problems associated with divorce, odds of reporting marital problems decreases as years married increases. South and Spitze (1986) note that there may be a relationship between risk of divorce and relationship disruption, though this relationship is conditioned upon other factors, such as educational attainment. Booth and colleagues find that marital instability is impacted by both marital duration and age, and suggest that this may be due, at least in part, to accumulation of assets across the life course (Booth, Johnson, White, and Edwards 1986). While the cultural context of the U.S. obviously differs from that of Ghana (and SSA more broadly) in many respects, these U.S. based studies suggest that, in addition to the culture-specific factors outlined above, there is also an impetus to consider demographic and relationship-specific variables, including age and relationship duration, to obtain a full picture of marital quality and stability.

In spite of increasingly long periods of premarital courtship and, sometimes, cohabitation in SSA (due, at least in part, to rising rates of unemployment and associated difficulties securing a bridewealth; Blum 2007), the correlates of instability in non-marital relationships in SSA are even less clear; nor are the implications of various premarital partnership patterns for relationship stability apparent. Research in the U.S. has focused on issues such as how premarital cohabitation impacts later marital quality and stability (see, for example, Jose, O'Leary, and Moyer 2010; Lichter and Qian 2008; Reinhold 2010), but the impact of cohabitation in SSA is likely to differ from that of the U.S. because of cultural meanings associated with cohabitation. Even within the U.S., the link between relationship stability and cohabitation varies by ethnic group (Phillips and Sweeney 2003); the presence of these ethnic group differences within the U.S. underlines the importance of accounting for culture-specific perceptions of premarital relationship patterns in understanding the implications for relationship stability. Thus, the surprisingly small number of studies of non-marital unions is troubling.

The few studies in SSA which have examined non-marital unions suggest that there are several key forms of non-marital unions: those which progress towards marriage, those which are entered into when a (male) partner is already involved in one or more existing unions, and those which are disrupted and do not end in a marriage. For those unions which progress to marriage, there is no one universal

path to be tread; rather, courtships vary by length, amount of family involvement, type and number of ceremonies, cohabitation patterns, and a variety of other factors (Meekers 1992). Relationships which do not transition to marriage may include (but are by no means limited to): partnerships which are entered into or sustained for economic gain—i.e. relationships with “sugar daddies” (Aryee 1997; Meekers and Calves 1997); those which arise from migration, such as when a husband migrates for labor and forms a non-marital union (Degrees du Lou 1999); partnerships to test fertility with a partner outside of an existing marriage (Barden-O’Fallon 2005; Bledsoe 2002; Mgalla and Boerma 2001); and, of course, those which begin with the possibility of marriage, but which terminate due to incompatibility of partners, where incompatibility could include a broad range of factors such as interpersonal factors, family disapproval, and financial inability to marry (Salm and Falola 2002). Note that these categories are not mutually exclusive. For instance, a woman may begin a relationship with a man who is already married. This relationship may eventually be terminated, may continue indefinitely, or may transition to a polygynous marriage.

4.2.2 *Social Consequences of Infertility*

As discussed in Chapter 3, childbearing is central to adult life in SSA. Children provide invaluable assistance in subsistence activities, child care for younger siblings, emotional fulfilment, continuation of the lineage, adult status, and economic security in old age (Caldwell et al. 1992; Gijssels et al. 2001; Robinson 1997; Sundby and Jacobus 2001). Though urbanization is on the rise, the predominant economic activity remains subsistence labor, ranging from agriculture to sales and trade (Salm and Falola 2002; Turner 2006). In such settings, children often provide substantial assistance with daily economic activities by performing manual crop labor, assisting customers and stocking items, or caring for younger siblings to free their mothers to participate more fully in economic activities. Children are thus considered a blessing, and having children is viewed as being deeply fulfilling, both emotionally and socially (Dyer 2007). Couples may experience substantial pressure from family members (particularly in-laws) to have large families, and quickly—particularly because the strong emphasis placed on ancestral ties in much

of SSA necessitate childbearing as a means of continuing the family lineage (Dyer et al. 2002; Mbugua 1997; Oppong and Abu 1987). Moreover, couples are generally eager to begin childbearing as having children is seen as a rite of passage into the realm of adulthood (Dyer 2007). Finally, social welfare systems are weak or nonexistent in most of SSA, and children are often looked to for support when parents can no longer care for themselves (Blum 2007).

In light of the importance of childbearing in SSA, it is perhaps unsurprising that infertility has serious social consequences. For example, infertility may cause one to seek other sexual partners, leading to the transmission of sexually transmitted diseases such as HIV/AIDS (Lunenfeld and Steirteghem 2004). This, in turn, increases the prevalence of secondary infertility, compounding the situation further. While one potential solution may involve asking the husband to have a child with another woman to preserve the marriage, this has become a dangerous strategy in light of HIV/AIDS (Mogobe 2005).

In addition to potential health consequences, infertile couples may face stigma and social isolation. In her study of involuntary childlessness in the United States and Canada, Miall (1986) found that expectations for childbearing are high in pronatalist societies, and couples are expected to want children, and often feel stigmatized if they cannot produce children. A similar phenomenon has been observed in SSA, where couples face severe stigma when they are unable to conceive or carry a child to term (Pearce 1999; Sundby and Jacobus 2001). Some women may even be accused of witchcraft, sexual promiscuity, or a history of abortions when they cannot have children (Feldman-Savelsberg 2002; Mgalla and Boerma 2001; Richards 2002).

Indeed, infertility in SSA is rarely formally diagnosed, and, without medical identification of infertility as male, female, or couple factor, blame often falls to the female partner (Gerrits 2002; Mgalla and Boerma 2001; Sundby and Jacobus 2001). Oftentimes it is deemed acceptable for a male partner to seek openly sexual partnerships outside of the union in the case of suspected infertility, while stringent gender roles prevent women from doing the same if male infertility is suspected (Barden-O'Fallon 2005; Bledsoe 2002). If a woman does seek an outside partnership, it is done in secret (and potentially even encouraged or arranged by the husband's family to preserve his reputation), and the paternity of any

child conceived from such a partnership is attributed to the husband. Ultimately, gendered expectations regarding responsibility for childbearing mean that women often shoulder a disproportionate share of the stigma associated with infertility, and frequently report name-calling, social isolation, stigma, and, in some cases, divorce and loss of custody of any existing children (Dyer 2007; Okonofua 1999). Moreover, due to social expectations, women tend not to attempt to deflect insults by blaming their husbands, and thus they become the primary target of blame and name-calling (Mgobe 2005).

Extant research also points to the importance of cultural, social, and biomedical technological differences within Africa for shaping the consequences of infertility. For instance, in an examination of male infertility in Muslim Egypt, Inhorn (2003) finds that, although couples in her sample had received a male factor diagnosis of their difficulties conceiving (and thus are known cases of male infertility), the women in the sample experience diminished gender identity and male-initiated divorce. This issue is compounded by reproductive technologies, as men receive treatment for their infertility and seek out new partners with whom to test their newfound fertility. Lineage systems also appear to have an important impact on responses to infertility: some studies have found that in matrilineal settings, women live near their natal families (rather than near the husband's family), which affords them protection from the most severe consequences of infertility (Gerrits 2002). In such systems, infertile women may not solely shoulder the blame for infertility, and may retain custody of their children in the event of infertility-related divorce.

Even accounting for these important differences in the effect of infertility across diverse cultural and social settings, however, it is clear that infertility has serious negative social consequences for couples and, particularly, for women. It is perhaps unsurprising in light of the serious negative social consequences infertile couples face that infertility has also been linked to relationship instability in SSA.

4.2.3 Infertility and Relationship Stability

Given the numerous links between infertility and negative social outcomes outlined above, it logically follows that infertility may have an impact on relationship quality and, potentially stability. Prior research in the U.S. and the U.K. has cer-

tainly shown a link between infertility, stigma, and distress; in turn, these factors have a demonstrated impact on relationship quality. An extensive body of literature in the United States explores the causes and consequences of infertility (see Greil 1997 for a review). Though much of the extant research focuses on implications for individuals, an increasing number of studies also consider how infertility impacts the well-being of couples, with emphasis on how distress among members of the dyad impact relationship quality (Andrews, Abbey, and Halman 1991; Peterson, Newton, and Rosen 2003). Studies that have considered the influence of infertility on relationship stability, in particular, tend to be outdated, with focus placed primarily on married couples. While some of these studies have found that members of the couple experience increased strain, which has a negative impact on relationship quality (see, for example, Smith, Walsh, Shindel, Turek, Wing, Pasch, and Katz 2009), others have found no effect, or even a positive effect, as couples bond during the process of diagnosis and, where pursued, treatment (Chester 1972; Gibson 1980).

Research in SSA is less ambiguous, typically showing that infertility negatively impacts relationship quality and, subsequently, increases the likelihood of marital disruption (Boerma and Urassa 2001; Leonard 2002; Okonofua 1999). As discussed above, couples in SSA are expected to have children quickly after marrying, and may experience substantial pressure to have children. The responsibility for childbearing falls primarily on women and, as such, infertility is disproportionately blamed on female partners, leading to sometimes severe distress. Conceivably the stress created by infertility may have a negative impact on relationship quality (though, as in the U.S. and U.K., coping with this stress and working to overcome fertility barriers to conceive could also bring the couple closer together). This decline in relationship quality could, in turn, lead to relationship disruption.

In addition to this potential indirect link between infertility and relationship disruption, extant research also suggests that there is a direct link. Specifically, in much of SSA, infertility is considered legitimate grounds for divorce, though, as discussed above, there are typically gender-specific limitations to this. However, while extant research consistently points to the importance of reproduction as a primary function of marriage, not all research shows that infertility is associated with divorce. Opong and Abu (1987), for example, point out that polygyny may

enable subfecund women to remain married, suggesting that polygyny may potentially reduce the risk of infertility-related marital disruption. Thus, while much of the extant literature in the region suggests that infertility may be associated with marital disruption, this relationship may not be entirely clear cut. Moreover, the impact of infertility on the stability of non-marital unions is virtually unknown.

4.2.4 *Contributions of the Current Study*

The current study makes several unique contributions to the growing literature on a) infertility and b) relationship disruption in SSA. Specifically, using longitudinal data from Ghana, I use event history analysis to explore the relationship between infertility and relationship stability. In contrast to prior studies, I focus not only on marital unions, but also on non-marital unions. As previously discussed, non-marital unions are an important form of romantic partnership in SSA; given that childbearing in Ghana is not restricted to occurring within marital unions, it is vital to explore not only marriages, but also non-marital sexual unions. Additionally, with some notable exceptions (see, for example, Boerma and Urassa 2001) studies which have explored the association between relationship stability and infertility have predominantly been qualitative, and the few existing quantitative studies have been cross-sectional. Expanding upon prior research, then, this study seeks to answer two main research questions: 1) Is there an association between infertility and relationship disruption, and 2) Does the risk of relationship disruption differ for those who are married as compared to those who are in non-marital sexual unions?

4.3 Data and Methods

4.3.1 *Data*

The analysis in this chapter utilizes the 8 waves of pooled longitudinal data collected by the Population Council of New York and the University of Cape Coast between 1998 and 2004 previously described in Chapter 3. To facilitate the discrete time hazard models, data were split into 11 equally spaced time points (to be discussed in greater detail in the *Analytic Strategy* section). Recall that a purposive

sampling design was utilized to maximize background characteristic and between-community diversity in the sample (see Casterline 2007 for a full description of the sampling frame and data collection). As in Chapter 3, the analysis will be limited to the data for female respondents (aged 15 to 50) only. Because the focus will be on relationship disruption, women who are not currently either a) married or b) involved in a sexual union are excluded from the sample.

Initially 1,219 women were interviewed in wave 1. To account for attrition between rounds 1 and 2, a select group of 219 women were added, providing both data contemporary to the round 2 interview date and retrospective data relevant to the round one questionnaire. I dropped an additional 12 cases due to attrition, and the sample was further restricted to women who are within the demographic age of fecundability (ages 15-49); women over the age of 50 were dropped. Given that the focus of this analysis is the transition out of a relationship, women not in a marital or non-marital union were excluded from the sample. A small number of women left their first marriage due to widowhood, which can be expected to differ substantively from other forms of relationship disruption, and is unlikely to have resulted from female empowerment, marital conflict, or most other causes of divorce or separation. Thus, these women were allowed to contribute to the data set while in their relationship, but were censored at the point of widowhood rather than being treated as though they had experienced an event.

The final sample size after limiting the sample to those of reproductive age who are in a union or marriage is 1,173; pooled across 11 time points, the sample size is 10,418. Note, the pooled sample is smaller than might be expected (12,903) by simply multiplying 1,173 respondents by 11 time points due to missing data at time points where women were not in relationships—in other words, women are missing data before they have entered a relationship and after they have experienced a relationship disruption. Additionally, there are substantially fewer records (4,827) available for models including self-identified infertility due to the fact that data on these items are only available in waves 6, 7, and 8.

Data were collected for 8 waves, with slightly less than one year between interviews on average. Respondents were given both a main survey containing questions relating to demographic and background characteristics, fertility attitudes and behaviors, contraceptive behavior, and other variables, and a retrospective calendar

data instrument for the months between waves for a select set of indicators. Calendar data focused primarily on fertility relevant information, such as birth control use for each month between the current wave and the previous one.

Missing data for background and demographic variables was around 3% in most cases; missing data did not exceed 30% for any of variables in the analyses. The variable measuring fertility desires had the highest amount of missing data (19.27%). Missing data were multiply imputed using the ICE procedure in Stata 11. A total of 10 imputed data sets were created with this procedure. Results shown are averaged across these data sets using the *mim* procedure, which adjusts the standard errors to account for the uncertainty introduced by imputation.

4.3.2 *Measures*

Dependent Variable

The dependent variable of interest is relationship disruption—that is, the event of a divorce (among married respondents only) or separation (for both marital and non-marital unions). This variable is a dichotomous measure at each time period, with individuals who are currently in a relationship coded 0 and those who have experienced the event (a disruption) coded 1 at that time point. Individuals who experience a disruption are dropped from subsequent time points. Thus, the event variable is coded as missing if either a) the respondent has not yet entered a relationship or b) the relationship has already ended at a prior time point. Multiple events are not considered here; respondents are coded as missing subsequent to a relationship disruption even if additional relationships can be observed later in the data set (discussed in greater detail below).

For example, a woman who enters the data set married and gets divorced at time 6 will be left-truncated (Box-Steffensmeier and Jones 2004), but will contribute information for each time period at which she was observed prior to the event (in this case, divorce) but subsequent to the start of the survey. Thus, for times 1 through 5, the event variable for this respondent will be coded 0; however, the variable will be coded 1 at time 6, and the event variable will be missing for times 7 through 11. Thus, respondent will not contribute data for times 7 through 11. Note, her marital duration prior to the start of the survey is not known.

Additionally, multiple events are not considered. So, for example, if the respondent from the previous example remarried at time 10, she would *not* re-enter the data set at that time; once a respondent has experienced an event, she contributes no additional data, regardless of whether she enters another union within the study time frame. Likewise, reconciliations with partners are not considered here. If, for example, a respondent is in a non-marital union at times 3 to 7, separates from her partner at time 8, and reconciles with her partner at time 10, she will only contribute data for times 3 through 8.

Independent Variables

The relationship between infertility and relationship instability is the primary concern of this chapter. Three measures of infertility are considered in the analyses which follow. First, based on the findings from Chapter 3, an epidemiological measure of infertility is included as a main predictor of relationship instability. Recall, the epidemiological measure of infertility identifies a woman as infertile if she is not contracepting, desires to have a child, and has not experienced a birth for 24 months subsequent to either a) the birth of a child or b) the beginning of a relationship.

Following Leonard (2001), self-identified infertility is used as the other main predictor of relationship instability. Two versions of self-identified infertility are included separately. First, I include basic self-identification, which, regardless of whether or not she is currently contracepting, classifies a woman as infertile if she answers takes a long time, impossible, or don't know to the question "When you want to become pregnant, do you become pregnant quickly, or does it take a long time?" or if she responded that she cannot get pregnant to a second question, "Would you like to have (a/another) child (with your husband/partner) or would you prefer not to have any (more) children (with him)". The final measure of infertility is the standard self-identified infertility measure from Chapter 3, which uses the same questions as responses as the basic measure, but which classifies a woman as not infertile if she is currently contracepting.

Both measures of self-identified infertility are examined because, although prior research has pointed to the importance of controlling for contraceptive behavior when measuring infertility (see, for example, Larsen 2005), contraceptives may be

used for purposes other than preventing pregnancy, including STI prevention and, in some cases, sufficient spacing to give the body adequate recovery time to aid in conception and health pregnancy (Bledsoe 2002). Thus, a woman may perceive herself as being infertile, and may experience distress—both personally and within the relationship—as a result of this perception. In other words, the perception of infertility may be distressing and detrimental to the relationship regardless of contraceptive behavior.

In addition to infertility variables, a continuous measure of age in years is also included. Given the strong, curvilinear relationship between age and infertility (see Chapter 3), as well as the inverse relationship between age and propensity to divorce found in extant literature (Booth et al. 1986), age in years is included to parse out the independent effects of age (if any) and infertility. A continuous indicator of relationship duration in months is also included to account for the potential effects of duration on relationship stability discussed above, as well as to control for duration dependency (Box-Steffensmeier and Jones 2004). Among women who are married, a dichotomous indicator of whether or not the respondent has any cowives (in other words, whether the relationship is polygynous) is included.

For those who are in a non-marital sexual union, a dichotomous indicator is included to indicate whether the union transitioned into a marriage during the period of observation, with those who did experience a transition from a union to marriage coded 1, and those who either experienced a disruption or remained in the union without marrying coded 0. This measure may be meaningful if relationship quality is higher and conflict lower among those who make the transition to marriage. Alternatively, the measure may also indicate a difference in type of non-marital union—that is, among those involved in the union, some unions may be conceived of as candidates for marriage from the start (or nearly), while others may be seen solely as non-marital arrangements, with no possibility for future marriage. It may be reasonable to expect that the latter would be more susceptible to disruption. Likewise, because it is not clear how non-marital unions compare to marriages in SSA, a dichotomous indicator of whether the relationship is a marital union (coded 1) or a non-marital sexual union (coded 0) is included to capture the qualitative differences which might exist between marital and non-marital unions.

For example, concern that the bridewealth will need to be returned may serve as a deterrent to divorce (Gijssels et al. 2001), whereas non-marital sexual unions may not have this disincentive from relationship disruption.

Ethnicity is also included as a control in the models; Takyi and Broughton (2006) find that ethnic identification may have an influence on divorce. Specifically, they note that within Ghana, membership in some ethnic groups may afford women more autonomy than others, which in turn, is associated with higher rates of divorce. Moreover, Addai and Trovato (1999) note that, though the association between ethnicity and fertility is strongly related to other socio-demographic characteristics, there does appear to be a relationship between fertility behaviors and ethnicity. Because of this relationship with fertility behaviors, then, ethnicity may also be associated with infertility, and is thus included here. However, due to small cell counts among some of the ethnic groups identified in the Cape Coast data, several categories were collapsed. Thus, differences between ethnic groups within collapsed categories cannot be assessed here (nor is it a primary focus of the paper). Ethnicity is measured here in five categories: Adangbe, Ga or Ewe, Denkyira, Fante, and Ahanta or Other (reference group).

Takyi and Broughton (2006) also suggest that women's autonomy (of which education is often considered to be an important indicator) is linked to increased propensity to divorce. Moreover, a woman's educational attainment is likely to influence her partner selection, which may, in turn, have implications for relationship quality and stability (Oheneba-Sakyi 1999). As such, education was considered as a control for inclusion in the models. However, in these data, education does not appear to be a significant predictor of relationship disruption in neither the zero-order nor fuller model relationship. In other words, in contrast to the link between relationship instability and education suggested by the literature, there does not appear to be any statistically significant relationship in the Cape Coast data. Likewise, some prior research has suggested a possible link between religious teachings, advice from religious leaders, and divorce (Anarfi and Owusu 2010), as well as between religious affiliation and fertility behaviors (Gyimah, Takyi, and Tenkorang 2008). As such, religion was included as a control in preliminary models. However, because no significant relationship was found, and because the association between religion and relationship stability is not a primary focus of the current

study, religious affiliation was not included as a control in the final models.

Preliminary analyses also tested for theoretically relevant curvilinear relationships and interactions. Where appropriate, curvilinear (squared) terms are included for age and relationship duration; interaction terms are included for age and relationship duration. Interactions were also tested for infertility and relationship type (marriage vs. union), infertility and relationship duration and for infertility and parity, but were not found to be significant and were not included in the final models. As in Chapter 3, where curvilinear or interaction terms were included which created extremely large values (age squared, relationship duration squared, and the age by relationship duration interaction in this case), the variables were divided by 1,000 to ensure that the coefficients were interpretable given the magnitude of the squared or interaction terms. While this process changes neither the strength nor the direction of the relationship, it does provide a sufficiently large coefficient to interpret.

4.3.3 *Analytic Strategy*

The analysis in this chapter applies discrete time hazard models to the pooled Cape Coast data to model the relationship between infertility and relationship stability. The data are pooled across 8 waves and arranged in a person-period format—that is, where each individual has as many listings in the data as measurement occasions (Allison 1995; Singer and Willett 2003). However, because there are uneven intervals between several of the interview dates (that is, 7 months may have passed between waves A and B, while 10 months passed between waves B and C), even time points were created based on a 6 month interval, resulting in a total of 11 time points across the 8 waves of data (Allison 1995; Teachman Forthcoming).

Time-varying variables were extrapolated based on the most temporally proximate measurement of the variable in question. Interview dates varied between respondents, as did the amount of time which passed between intervals (usually by a maximum of a few months). The first time point for each respondent was set to be the date of her first interview. For example, assume that Respondent 1 was interviewed in wave 1 in January of 1998, wave 2 in September of 1998, and wave 3 in September of 1999. Because the time points for the event history analysis

are spaced evenly at six month intervals and time one is set to be equal to the first interview date, time-varying covariates (TVC's) for time one all come from wave 1. For this fictitious respondent, TVC's at time two would come from wave 2 because 6 months from t1 would be July of 1998, which is temporally closer to wave 2 than wave 1. The next time point, time 3, would be 6 months from July of 1998—that is, January of 1999. Since this time point is closer to the wave 2 interview date (September 1998) than to the wave 3 interview date (September 1999), time-varying covariates for time 3 would be drawn from interview 2 for this respondent. Time 4—July of 1999—is closer to the wave 3 interview date than the wave 2 date, so TVC's for this time point are drawn from wave 3. This same logic applies across waves, totaling 11 time points. It is worth noting that the models may underestimate the effects of infertility for women who begin the survey infertile or who do not become infertile over the waves of data, resulting in a more conservative estimate.

4.4 Results

4.4.1 *Descriptives*

Table 4.4.1 provides descriptive statistics for the Cape Coast data pooled across 11 time points of data. Recall that the sample herein is a limited subset of the full Cape Coast sample—that is, these descriptives represent women in the sample of reproductive age who are in a relationship. Given the selective nature of the sample, certain statistics, such as rates of marriage and sexual unions, vary substantially from what might be expected from the full sample. Descriptive statistics for the full sample can be seen in Table 3.3 in Chapter 3.

Table 4.4.1 shows the prevalence of each of the three measures of infertility included in the analyses. Records are pooled across the the 11 time points (except in the case of self-identified infertility, which is pooled across 5 time points due to limitations in data availability), resulting in 10,418 total records (4,827 records for self-identified infertility). Just under 15% of the sample experiences a relationship disruption at some point during the observation period. Note, however, that the number of relationship disruptions is lower than the number of disruptions ob-

Table 4.1. Descriptive Statistics for Cape Coast Across 11 Time Points

	Mean	St. Dev.	Min	Max
Relationship Disruption	0.14	0.35	0	1
Epidemiological Infertility	0.08	0.27	0	1
Basic Self-ID	0.56	0.50	0	1
Standard Self-ID	0.11	0.31	0	1
Age in Years	29.61	8.60	15	50
Relationship Duration	47.47	19.55	1	66
Marital Union	0.87	0.34	0	1
Union Transitioned to Marriage	0.17	0.38	0	1
Cowives	0.26	0.44	0	1
<i>Parity</i>	4.23	2.80	0	14
No Children	.06	.23	0	1
Only One Child	.09	.28	0	1
More Than One Child	.85	.39	0	1
<i>Education Level</i>	–	–	–	–
No Education	0.40	0.49	0	1
Some Primary School	0.18	0.39	0	1
Finished Primary School	0.07	0.25	0	1
Attended Middle School	0.32	0.47	0	1
Attended Secondary School	0.03	0.17	0	1
<i>Ethnicity</i>	–	–	–	–
Adangbe	0.14	0.35	0	1
Ga or Ewe	0.10	0.30	0	1
Denkyira	0.12	0.33	0	1
Fante	0.52	0.50	0	1
Ahanta or Other	0.11	0.31	0	1
<i>Religious Affiliation</i>	–	–	–	–
Catholic	0.15	0.35	0	1
Protestant	0.19	0.39	0	1
Moslem	0.22	0.41	0	1
Pentecostal or Charismatic	0.22	0.41	0	1
Syncretic, Traditional, or Other	0.14	0.35	0	1
None	0.08	0.29	0	1

N=1,173

servable in the full data set because if a respondent starts divorced or separated and does not enter a new union during the course of the survey, her disruption will be observable, but, because no relationship could be observed, she will be excluded from the sub-sample. Moreover, this figure does not include multiple

disruptions—that is, if a respondent separates from her husband, reconciles with him, and the couple later divorces, only the separation will be captured by the relationship disruption variable.

Nearly 10% of the the sub-sample experiences epidemiological infertility (24 month objective measure). Self-identified infertility is higher: 56% self-identify when birth control is not accounted for, while 11% self-identify once those who are currently contracepting are coded as not infertile. The average age for women in the sub-sample is 29.61 years; age ranges from 15 to 50 years. The average relationship duration in the sample is 47.47 months, though this figure ranges from as short as 1 month to as many as 66 months. The majority of the women are in a marital union (87%), while a substantial minority (13%) are in a non-marital sexual union. Among those who are in a union, only 17% transition from a union into a marriage at some point during the 11 time points at which they were observed. The remaining 83% either remain in a union and are right-censored or experience a relationship disruption. Among those who are married, about a quarter of the women (26%) have one or more cowives, while the remaining 74% are monogamously married. Parity is presented both as an interval measure, which ranges from 0 to 14 children, with the mean at 4.23 children per woman, and as a categorical measure (which appears in the hazard models). Only 6% of respondents have no children, and an additional 9% have one child, while the remaining 85% of the sub-sample has more than one child.

In addition to descriptives for relationship and childbearing measures, Table 4.4.1 also provides descriptives for several background characteristics theorized to be associated with family formation and childbearing—namely level of education, ethnicity, and religious affiliation. In terms of educational attainment, nearly half of the subsample (40%) have never attended school. An additional 18% have attended primary school, while 7% report finishing primary school but not attending middle school. Thirty-two percent have attended middle school, and a small minority (3%) have attended or completed secondary school. A majority of the women identify with the Fante ethnic group (52%), followed by Adangbe (14%), Ga or Ewe (10%), Denkyira (12%), or Ahanta or some other ethnic group (11%). The vast majority of the sample identifies with some religion; only 8% of respondents are not affiliated with any religion. Moslem (22%) and Pentecostal or Charis-

matic (22%) religions are the most commonly reported affiliations, followed closely by Protestant (19%) and Catholic (15%). Finally, 14% identify with a syncretic, traditional, or another religion.

4.4.2 *Hazard Models*

Table 4.2 shows the hazard models predicting relationship disruption as a function of epidemiological infertility, fertility variables, and socio-demographic factors. Model 1 provides the zero-order relationships—that is, the univariate relationship between union disruption and each of the predictor variables independently. Looking first at epidemiological infertility, there is a positive, non-significant association between infertility and relationship disruption. There is also a positive relationship between disruption and age, though this association is somewhat curvilinear. Specifically, the association is weakly positive at younger ages, but begins to increase more dramatically beginning around the mid-twenties. Likewise, there is also curvilinear association between relationship duration and disruption: the odds of disruption are only slightly below zero when relationship duration is low; however, the odds begin to decline dramatically around the two year mark. Being in a polygynous marriage is also significantly associated with relationship disruption, with those in polygynous marriages having 68% higher odds of experiencing a disruption than those who are not in a polygynous marriage. Surprisingly, those in unions which transition to marriage (rather than terminating prior to marriage) actually have significantly higher odds of disruption (OR=2.45), while those who are married have substantially lower odds (OR=.09) than those who are in a non-marital union. There is also a significant, positive association between parity and relationship disruption; both women with no children (OR=3.57) and those with only one child (OR=1.88) have greater odds of experiencing a disruption than those who have more than one child. Finally, ethnicity is significantly associated with disruption, with all ethnic groups having greater odds of disruption than Ahanta or those identifying with some other ethnic group. Denkyira respondents have the highest odds of disruption (OR=4.03), followed by Adangbe (OR=2.82), Ga or Ewe (OR=2.27; non-significant), and, finally, Fante (OR=1.69; non-significant).

Model 2 in Table 4.2 shows the multivariate model with epidemiological infer-

Table 4.2. Hazard of Relationship Disruption Accounting for Epidemiological Infertility

	Model 1			Model 2			Model 3		
	OR	St. Error	OR	St. Error	OR	St. Error	OR	St. Error	
Epidemiological Infertility	1.55	0.46	1.35	0.41	0.95	0.40	0.95	0.40	
Age	0.78	***	0.78	***	1.03	0.07	1.03	0.07	
Age Squared	1.42	***	1.42	***	0.93	0.10	0.93	0.10	
Relationship Duration	1.04	*	—	—	1.04	0.02	1.04	0.02	
Duration Squared	0.13	***	—	—	0.13	0.04	0.13	0.04	
Cowives	1.68	*	—	—	1.91	0.57	1.91	0.57	
Union to Marriage	2.45	***	—	—	0.94	0.20	0.94	0.20	
Married	0.09	***	—	—	0.71	0.15	0.71	0.15	
Infertility*Married	1.57	—	—	—	1.72	1.06	1.72	1.06	
<i>Parity</i>	—	—	—	—	—	—	—	—	
No Children	3.57	***	—	—	0.63	0.18	0.63	0.18	
Only One Child	1.88	**	—	—	0.63	0.17	0.63	0.17	
<i>Ethnicity</i>	—	—	—	—	—	—	—	—	
Adangbe	2.82	**	—	—	1.29	0.54	1.29	0.54	
Ga or Ewe	2.27	—	—	—	1.41	0.64	1.41	0.64	
Denkyira	4.03	***	—	—	1.95	0.81	1.95	0.81	
Fante	1.69	—	—	—	1.40	0.55	1.40	0.55	
Ahanta or Other (reference)	—	—	—	—	—	—	—	—	
Pseudo R-Squared	—	—	.02	—	.34	—	.34	—	

Notes: *p<.05; **p<.01; ***p<.001; N=1,173; Records=10,418

tility, age, and the curvilinear term for age. Once again, the odds of disruption for infertile respondents is positive but non-significant, and the magnitude of the odds ratio is somewhat reduced. The relationship between age and the hazard of disruption is unchanged from the univariate case. Thus, it appears that a small portion of the relationship between disruption and epidemiological infertility is mediated by age. The Pseudo R-Squared measure suggests that these predictors explain a small portion of the variance in relationship disruption (about 2%).

Finally, Model 3 shows the full multivariate model with all predictors included. In the full model, infertility is still non-significant, but operates in the opposite direction (OR=.95). This suggests that some of the effect of infertility is mediated by the fertility and, potentially, socio-demographic variables. The relationship between age and relationship disruption has reversed, though it remains curvilinear: in Model 3, the odds of identification are low at low ages, then declines dramatically beginning in the mid-twenties, suggesting that much of the effect of age in fact operates through other fertility and socio-demographic factors. Relationship duration, on the other hand, remains unchanged from the univariate case. The effect of polygynous marriage is significant, and greater than in the univariate model (OR=1.68), with those in polygynous marriages having greater odds of disruption than those who are not involved in a polygynous union. The remaining covariates are no longer significant in the full model, and have either been substantially reduced (marriage type and ethnicity) or have changed direction (transition from union to marriage and parity). The Pseudo R-Squared in this model suggests that together, these variables explain 34% of the variance in relationship disruption.

Table 4.3 provides the results of the hazard models predicting relationship disruption as a function of basic self-identified infertility (that is, where contraceptors who self-identify are not coded 0), fertility variables, and socio-demographic variables. As in the previous table, Model 1 here provides the univariate relationships between disruption and each of the covariates. There is a strong, significant, positive association between basic self-identified infertility and relationship disruption; those who self-identify as infertile have over 5 times the odds of relationship disruption compared to those who do not identify as infertile. Age is also associated with relationship disruption: for every one year increase in age, there is a 4% decrease in the odds of relationship disruption. Given that the relationships in

Table 4.3. Hazard of Relationship Disruption Accounting for Basic Self-Identified Infertility

	Model 1			Model 2			Model 3			Model 4		
	OR	St. Error	(Univariate)	OR	St. Error		OR	St. Error		OR	St. Error	
Basic Self-ID	5.11	***		5.08	***		5.36	***		5.16	***	
Epidemiological Infertility	—	—		—	—		—	—		—	—	
Age	0.96	***		1.00			1.02	0.02		1.02	0.02	
Relationship Duration	1.04	*		—	—		1.00	0.04		1.00	0.04	
Duration Squared	0.13	***		—	—		0.32	0.16	**	0.30	0.15	**
Cowives	1.68	*		—	—		4.07	1.77	**	4.14	1.84	**
Union to Marriage	2.45	***		—	—		1.33	0.42		1.35	0.43	
Married	0.10	***		—	—		0.30	0.09	***	0.31	0.09	***
<i>Parity</i>	—	—		—	—		—	—		—	—	
No Children	3.57	***		—	—		0.27	0.14	**	0.25	0.13	**
Only One Child	1.88	**		—	—		0.35	0.15	*	0.35	0.15	*
<i>Ethnicity</i>	—	—		—	—		—	—		—	—	
Adangbe	2.82	**		—	—		1.19	0.88		1.15	1.00	
Ga or Ewe	2.27			—	—		2.21	1.66		2.22	1.65	
Denkyira	4.03	***		—	—		2.96	2.14		3.10	2.24	
Fante	1.69			—	—		2.01	1.36		2.03	1.44	
Ahanta or Other (reference)	—	—		—	—		—	—		—	—	
Pseudo R-Squared	—	—		.02			.31			.31		

Notes: *p<.05; **p<.01; ***p<.001; N=1,173; Records=4,827

Model 1 are univariate, the remaining coefficients are identical to those in Model 1 of Table 4.2. Model 2 of Table 4.3 shows the association between infertility and relationship disruption controlling for age. Though the magnitude of the relationship is somewhat diminished, the positive effect of infertility (OR=5.08) remains strong and highly significant, while the association between age and disruption disappears. The Pseudo R-Squared suggests that basic self-identified infertility and age account for around 2% of the variance in relationship disruption—roughly equivalent to the amount of variance explained by epidemiological infertility and age in Table 4.2.

Model 3 shows the model with all of the fertility and socio-demographic predictors. The effect of infertility actually increases in this model, with women who self-identify having nearly 5.5 times the odds of relationship disruption compared to those who do not self-identify. The effect of age is positive but non-significant in this model, while relationship duration is, negative, significant and slightly curvilinear; the odds of disruption decline slowly at first, then more rapidly as duration increases. The effect of polygynous marriage is substantially greater in this model, with those in polygynous marriages having more than 4 times the odds of disruption as those who are in monogamous unions. The effect of a transition from a union to a marriage is no longer significant in this model, while those who are married still have significantly lower odds of disruption (OR=.30). The effect of parity has also change substantially, with those who have no children (OR=.27) or only one child (OR=.35) now having lower odds of disruption than those with more than one child. this may suggest that, once infertility is accounted for, having more children actually places greater strain on the relationship. Finally, the effect of ethnicity is no longer significant, and, in most cases, is lower than in the univariate case. Here, the Pseudo R-Squared shows that the full model explains 31% of the variance in relationship disruption.

Finally, Model 4 adds epidemiological infertility to the predictors in Model 3 in order to parse out the effect of perceptions about infertility status as compared to more objective subfecundity. In other words, Model 4 tests whether it is underlying subfecundity or the perception of difficulties conceiving which is important for the association between infertility and relationship disruption. Presumably, if the perception is the salient factor, the effect of self-identification should remain

largely unaffected by the inclusion of epidemiological infertility; conversely, if underlying subfecundity is more salient than the perception of infertility, the effect of self-identification should be substantially diminished. Model 4 shows that the former assumption holds, suggesting that the perception of infertility is strongly, significantly associated with disruption even controlling for underlying subfecundity. The Pseudo R-Squared is unchanged between Models 3 and 4, suggesting that the inclusion of epidemiological infertility adds very little to the explanatory power of the models.

The final models, which predict the hazard of relationship disruption as a function of standard (accounting for birth control use) self-identified infertility, are presented in Table 4.4. Model 1 provides the results for the univariate relationships. Self-identified infertility is significantly, positively associated with relationship disruption; however, the magnitude of this relationship is substantially smaller than that observed between basic self-identification and disruption. For every one year increase in age, there is a corresponding 4% decline in the odds of relationship disruption, while a significant, curvilinear association exists between relationship duration and disruption. This association differs very slightly in magnitude but not direction from that shown in previous models because a significant interaction was found between age and relationship duration. The remaining univariate relationships shown in Model 1 do not differ from those observed in previous tables.

Model 2 shows the results of the hazard model including standard self-identified infertility and age. The effect of infertility actually increases somewhat, while age is no longer a significant predictor. Model 3 provides the full model (excluding epidemiological infertility). Neither age nor infertility are significant in this model, suggesting that much of the effect of these variables operates through the other fertility and socio-demographic variables. The curvilinear relationship between disruption and duration remains significant, though the decline in the odds of disruption is slightly less steep than in Model 1. Meanwhile, the effect of polygyny increases (OR=3.75), with those in polygynous marriages being more likely to experience a disruption. Transition from a union to a marriage is no longer significant (though still positive; OR=1.51), while the negative effect of relationship type is still significant (OR=.28). Parity is also significant, though in the opposite direction: those with no children (non-significant) or only one child have around

Table 4.4. Hazard of Relationship Disruption Accounting for Standard Self-Identified Infertility

	Model 1		Model 2		Model 3		Model 4	
	OR	St. Error	OR	St. Error	OR	St. Error	OR	St. Error
Standard Self-ID	2.02 *	0.68	2.23 *	0.78	1.63	0.59	1.13	0.53
Epidemiological Infertility	—	—	—	—	—	—	1.80	0.90
Age	0.96 ***	0.01	1.02	0.01	1.04	0.04	1.03	0.04
Relationship Duration	1.03 *	0.02	—	—	1.00	0.04	0.99	0.04
Duration Squared	0.13 ***	0.04	—	—	0.28 *	0.13	0.32 *	0.16
Age*Relationship Duration	1.06 *	0.03	—	—	0.99	0.10	1.01	0.10
Cowives	1.68 *	0.41	—	—	3.75 **	1.61	3.73 **	1.61
Union to Marriage	2.45 ***	0.45	—	—	1.51	0.50	1.53	0.51
Married	0.10 ***	0.02	—	—	0.28 ***	0.08	0.28 ***	0.08
<i>Parity</i>	—	—	—	—	—	—	—	—
No Children	3.57 ***	0.73	—	—	0.46	0.23	0.41	0.21
Only One Child	1.88 **	0.42	—	—	0.43 *	0.19	0.42 *	0.18
<i>Ethnicity</i>	—	—	—	—	—	—	—	—
Adangbe	2.82 **	1.15	—	—	1.15	0.83	1.12	0.82
Ga or Ewe	2.27	1.01	—	—	2.09	1.56	2.13	1.59
Denkyira	4.03 ***	1.60	—	—	2.86	2.04	3.01	2.16
Fante	1.69	0.66	—	—	2.12	1.43	2.16	1.45
Ahanta or Other (reference)	—	—	—	—	—	—	—	—
Pseudo R-Squared	—	—	.04	—	.34	—	.34	—

Notes: *p<.05; **p<.01; ***p<.001; N=1,173; Records=4,827

55% lower odds of disruption than those with more than one child. Ethnicity is not longer significant in this model.

Finally, Model 4 shows the full model with epidemiological infertility included. Given that the effect of epidemiological infertility is non-significant in both Model 3 and Model 4, it is difficult to accurately assess the effect of including epidemiological infertility. However, the fact that the effect of self-identification is not reduced to zero (nor is the direction reversed) suggests that, similar to the findings in Model 4 of Table 4.3, the perception of infertility appears to matter even when underlying subfecundity is controlled for. The Pseudo R-Squared in for these Models shows a similar pattern to those observed in previous tables; however, self-identification and age together explain a larger portion of the variance than observed previously (4%), and the full models explain about 34% of the variance in relationship disruption. The inclusion of epidemiological infertility does not increase the explanatory power of the models.

4.5 Discussion

4.5.1 *Conclusions*

This study has sought to answer two main questions: 1) what, if any, is the association between infertility and relationship disruption and 2) does this relationship differ by union type? Results of the hazard models have shown that there does appear to be a positive association between infertility and relationship disruption. However, this association appears to be substantially stronger for self-identified infertility, suggesting that the perception of infertility may, in fact, be more salient for relationship stability than is the underlying (in)ability to conceive. This finding stands to reason, as it is the reaction to perceived infertility which causes distress; underlying subfecundity is less likely to be distressing if one is unaware of the problem conceiving. Additionally, if without the perception of infertility, difficulties conceiving cannot be identified as a justification for divorce. Arguably, since divorce in the case of infertility is typically initiated by the male partner, the female partner's perception of infertility may not be as salient as the male partner's perception of her infertility status. However, because male partners often control

fertility decisions (Dodoo 1998), women may experience pressure both from within the dyad and from in-laws. Thus, presumably the male partner's perception of infertility will strongly influence the female partner's perception, and the female respondent's perception will adequately capture the role of perceived infertility in shaping relationship disruption.

This study has also shown that there are substantial differences by relationship type in the hazard of experiencing a relationship disruption. Specifically, those who are married have significantly lower odds of experiencing a disruption than those who are in a non-marital union. Given that a significant interaction was not found between infertility and relationship type, it appears that this association holds for both fertile and infertile women.

In addition, other findings of the study, though not the central focus of the paper, provide some unique insights into marital disruption in SSA. First, women in polygynous marriages face a substantially higher risk of relationship disruption than do those who are monogamously married. Though it is unclear exactly what the driving force behind this finding is, one possibility may be that women in polygynous unions feel neglected or do not feel adequately supported and may be more inclined to attempt to leave the marriage. Conversely, it may be that entry into a polygynous union may, in some cases, stem from existing marital troubles. Alternative explanations may also be plausible, and future research should explore this relationship more fully. In addition to polygyny, parity is also a significant predictor. In the univariate case, compared to those who have more than one child, having no child or only one child greatly increases the odds of relationship disruption. Contrary to what might be expected, however, having one or no children actually reduces the odds of relationship disruption once infertility and socio-demographic factors are accounted for. One explanation might be that the effect of parity differs by perceived infertility status—that is, while low parity may increase the risk of relationship disruption for women who are infertile, low parity among those who are not infertile may simply reflect that the couple has not begun trying to conceive yet. However, preliminary analyses suggested that the interaction between parity and infertility is not significant, suggesting that another explanation may apply. Further investigation of the relationship between parity and relationship disruption is needed.

In sum, this study provides empirical evidence that the perception of infertility may contribute to an increased risk of relationship disruption, both for married couples and for those who are in a non-marital sexual union. Additionally, it appears that married couples are less likely to experience a disruption than couples who are not married. It is worth noting that alternative explanations may also apply to these findings. For instance, rather than perceiving infertility giving rise to an increased risk of relationship disruption, it could also be the case that some women experience declines in relationship quality and, unsure of what other factors may account for this decline, will attribute their marital difficulties as arising from an inadequate pace of childbearing. However, given the link between infertility and divorce established in qualitative research, it is reasonable to believe that infertility may, in fact, impact the risk of relationship disruption.

4.5.2 *Limitations*

First, due to sample size limitations, I was unable to distinguish between primary and secondary infertility; infertility subsequent to the birth of at least one child is likely to be qualitatively different than childlessness, and could conceivably have a different (or, perhaps more accurately, attenuated) effect on relationship stability. While I do control for whether the respondent has had no children, one child, or more than one child, these measures also include women who are not infertile and, thus, may actually downplay the importance of parity if women who are not infertile are also not distressed by low fertility (for example, if they are currently at low parity due to choice rather than inability to conceive).

Moreover, for relationships which began prior to the first interview date, it is not possible to tell whether any existing children were born in the current relationship or a previous relationship. Children who were born in a previous relationship are unlikely to satisfy the expectation that marriages will result in childbearing; childbearing prior to the current relationship but not within the current relationship may differ very little from childlessness—at least in terms of implications for relationship stability. Similarly, due to left truncation, there is also no way to know how many women have had at least one marriage which ended prior to the start of the survey; it may be the case that the first marriage is qualitatively different—

especially if the second husband knows that the wife has had previous difficulties with infertility. These issues should be explored using longitudinal data with full marital histories available. Likewise, the current study does not examine multiple events, but it may be that the disparities between fertile and infertile women in the risk of experiencing a relationship disruption are even greater when multiple disruptions are considered.

Additionally, bridewealth may have an impact on risk of divorce by serving as a disincentive (Takyi and Broughton 2006), but no measure of bridewealth is available in the Cape Coast data used for this analysis. It would be of interest to know whether the relationships found in the current study hold when controlling for socioeconomic status of the natal family and the cost of the bridewealth—particularly because the bridewealth is, in a latent way, conceptualized as the purchase of reproductive capacity. However, constructing an adequate measure which captures the significant components of the bridewealth may be difficult.

It is also worth noting that, although I included ethnicity in the models, it may have been more useful to look at the matrilineal/patrilineal distinction given 1) Takyi and Broughton's (2006) findings that women from matrilineal ethnic groups are more empowered to divorce and 2) given that women in matrilineal settings may retain custody of their children and, thus, may not fear loss of access to children as a consequence of relationship disruption (Gerrits 2002). Moreover, because ethnic group categories were collapsed due to sample size limitations, differences in the hazard of relationship disruption between groups within collapsed categories cannot be assessed. Likewise, it was not possible to examine rural/urban differences in the risk of disruption, which may have an important effect on disruption (Takyi and Broughton 2006). Furthermore, there is a need to examine if the effects found here also apply to men given that men have the power in the relationships, and may have greater influence in determining whether the relationship will end.

Finally, a more broad theoretical critique of studies of marriage in SSA may also apply. As Meekers (1992) points out, marriage in SSA is not a discrete process wherein one simply transitions from being never-married to being married through one easily measured event. Rather, the process of entering a marriage may take up to several years; parsing out timing of entry into sexual unions, cohabitation, traditional and formal ceremonies, and other substantively significant milestones

is likely to be important for understanding how relationship dynamics and entry into marriage may influence fertility and family planning behavior. While the present study attempts to provide a more nuanced picture of relationship stability by examining both marital and non-marital unions, the analyses are still focused on single item reports of current relationship status, and, thus, cannot provide the level of nuance called for by Meekers. Future studies should examine this issue more fully using richer, more detailed relationship data.

Conclusions

5.1 Summary of Findings

The African family is undergoing many significant changes, and strategies for navigating the confluence of traditional and more western norms, values, and behaviors are diverse and ever-evolving (Aryee 1997). The management of both traditional and western ways of life has produced some unique changes in the family as an institution, with mixed consequences for those of reproductive age. For instance, while age at first intercourse is declining, unemployment, urban poverty, female education, and age at first marriage are all on the rise (Blum 2007) in much of SSA, with complex and far-reaching consequences for adults of childbearing age in SSA. With an increase in the age at first marriage and a decline in the age at first intercourse comes a rise in adolescent parenthood. Traditional norms against non-marital adolescent childbearing still exist in much of SSA, and gender systems which reinforce behavioral double-standards for young men and women, including disempowerment of women in the realm of sexual negotiation, increase the risk of teen pregnancy, STI transmission, and unsafe abortion among young women (Varga 2003).

Given the link between STI's, unsafe abortions, unsafe child delivery practices, and pelvic inflammatory disease, which is in turn linked to infertility, social and cultural systems which place young women in such a precarious position are concerning for those interested in the causes and consequences of infertility. Moreover, as Brady (2003) points out, much of the existing rhetoric addressing repro-

ductive health concerns in SSA (particularly those targeting teens) focus on dual protection—that is, protecting against unintended pregnancy and STI's. Brady (2003) contends that linking infertility to unsafe abortions and STI's may ensure that young women make safe, healthy sexual choices. However, while Brady's point that public education regarding the causes of infertility may provide an additional incentive for safe sexual practices is valid and important, male role theory would also suggest that educating women and placing the responsibility for sexual health primarily on their shoulders ignores the role of the gender system in SSA (Dodoo and Frost 2008).

In sum, there is a highly complex relationship between infertility, gender systems, and reproductive health more broadly in SSA. Seeking to contribute to our understanding of these complex issues, the studies in Chapters 2, 3, and 4 explore the measurement and social consequences of infertility in Ghana. Taken as a whole, the findings in these chapters suggest that infertility is a serious but under-studied problem in Ghana. Chapter 2 uses qualitative data from Accra to explore the implications of infertility for mental health, social and romantic relationships, and physical well-being. The findings from this chapter suggest that infertility is associated with negative outcomes in each of these realms, based on the assessments of both fertile and infertile women. In Chapter 3, the measurement of infertility is examined using longitudinal quantitative data. A variety of self-identified, biomedical, and demographic measures are analyzed; based on this analysis, it appears that clinical (12 month) and self-identified infertility are the most appropriate measures for social research in the region. Finally, Chapter 4 assesses how infertility is related to the disruption of both marital and non-marital relationships. There appears to be a positive association between infertility and the risk of relationship disruption, with the greatest effects found for self-identified infertility; this suggests that the perception of infertility is particularly salient for shaping relationship outcomes. Broadly speaking then, the findings of this work suggest that infertility is a serious social problem in SSA, though our measurement of infertility is inadequate for fully understanding these complex associations.

5.2 Limitations

There are several limitations of the studies in this work. First, neither the qualitative nor quantitative data sets analyzed herein are nationally representative (nor are they representative of SSA more broadly). Moreover, the qualitative study relies on data collected solely in Accra; it is conceivable that different results may have been obtained had a sample including women from rural areas been examined. Further research is needed using representative samples.

Second, the measure of self-identified infertility used in the quantitative chapters asks women if they become pregnant quickly or if it takes a long time to obtain a pregnancy. However, a woman could potentially believe that it takes a long time to become pregnant, but not necessarily believe that she is experiencing a fertility barrier. Thus, another measure of self-identification may be more valid for assessing women's own perceptions of their infertility status. Moreover, it could potentially be the case that more nuanced measures of infertility may further our understanding of how infertility operates in different relationship contexts—such as in non-marital unions versus marriages. For instance, tracking current fertility intentions and desired birth timing, rather than overall intentions, may potentially show that while married couples are currently trying to conceive, couples in unions are less concerned with conceiving quickly; this may have important implications for the consequences of infertility.

Third, the exploration of relationship histories (particularly relevant for Chapter 4) are limited in nature. For instance, the hazard models predicting relationship disruption are limited to single events; different processes may be in place during a second, third, or fourth disruption than during a first disruption. Such differences between first and higher order disruptions cannot be captured by models which do not consider multiple events. Similarly, following Meekers (1992), a single measure asking respondents for current relationship status cannot capture significant differences between the various states of relationships leading up to marriage. This observation is particularly important in the context of SSA, where pathways to marriage may be long and diverse.

Finally, the current study is limited to female respondents; although women may shoulder a disproportionate share of the blame for infertility, difficulties con-

ceiving ultimately still occur within a couple context. Understanding how the social phenomena observed in the preceding chapters is similar to and different from the experiences of male in infertile couples is vital for obtaining a complete picture of infertility in SSA. Likewise, an examination of couple dynamics may provide further insights into the implications of infertility in SSA.

5.3 Directions for Future Research

Based on the findings and limitations of the current work, there are several important directions for future research. As previously mentioned, it will be essential to extend the current findings within Ghana using nationally representative data to see if the relationships hold. Similarly, examining whether the findings hold in other countries in SSA will also be an essential area for future research.

Additionally, as alluded to previously, it will be necessary to consider other measures of self-identification in order to obtain the most valid possible measure. Finding survey data for the region which includes any measure of infertility can be difficult; while the measures included in these studies were selected based primarily on their availability in existing data, the negative consequences of infertility shown in the previous chapters suggests that infertility merits increasing attention in survey data. Future data collection efforts should include measures of self-identification, both to assess the validity of measures and to explore further the consequences of infertility across the sub-continent.

In a similar vein, future research should examine measurement of relationship status. Meekers (1992) discusses the need for a multiple indicator approach to understanding relationships, and contends that survey research in the region needs to be of a higher quality and more detailed to provide a fuller understanding of relationship dynamics. Establishing a valid multiple indicator approach as called for by Meekers would be useful not only for understanding the steps which couples take when forming a relationship, but also the interplay between infertility and relationship quality and stability. For instance, while some research (Baren-O'Fallon 2005) has suggested that fertility may be tested prior to marriage, it is unclear how common this practice actually is; nor is it clear whether or how the difficulty of ending the relationship in the event of suspected (or confirmed) infertility may

differ depending on where on the path to marriage the couple is at the time of suspected infertility.

Finally, though Chapter 2 provided some qualitative evidence that there may be a link between infertility and physical health, empirical models of the link between general health and infertility are lacking. In particular, given the high likelihood that the relationship between infertility and health may be reciprocal in nature, it is crucial that this relationship be modeled using longitudinal models.

In sum, future research should focus on extending the findings of this work, both within Ghana and to other areas of SSA. Furthermore, attempts should be made to improve the scope and quality of survey research in the region, and longitudinal empirical research should be conducted to bolster findings from extant qualitative literature.

Appendix **A**

Primary Data Collection Instrument

A.1 Instrument

- 1 Location:
- 1 Accra
 - 2 Legon
 - 3 Other:
- 2 Structure:
- 1 R's Home
 - 2 Clinic
 - 3 Outdoors
 - 4 Other:

If equal 2, 3, 4 then skip to q4

- 3 What is the main material of the walls of the respondent's house?
- PALM/WOOD PLANKS/
BAMBOO 1
 - MUD/CLAY/SWISH 2
 - LANDCRETE BLOCKS 3
 - BURNT BRICKS 4
 - CEMENT BLOCKS 5
 - OTHER_____ 6
(SPECIFY)

4 Date of Interview:

5 Interviewer Name:

6 Language used in interview:

- 7 Was anyone else present during the interview?
- 1 Yes
 - 2 No

if 6=No, skip to q8

8 Who else was present during the interview? (list all)

- 9 Is the respondent's house connected to electricity?
- 1 NO
 - 2 YES

- 10 In what month were you born?
- 1 Jan
 - 2 Feb
 - 3 March
 - 4 April
 - 5 May
 - 6 June
 - 7 July
 - 8 Aug
 - 9 Sept.
 - 10 Oct
 - 11 Nov
 - 12 Dec

- 11 In what year were you born?
- 12 How old were you on your most recent birthday
(should match age based on birthday--clarify if mismatch)
- 13 Have you ever attended school? 1 Yes
2 No
- if No, skip to question 17
- 14 What is the highest level of school you attended? 1 Primary
2 Secondary
3 Higher
- 15 What is the highest standard/form/year of school you have completed?
- 16 Are you currently enrolled in school? 1 Yes
2 No
- 17 What was the highest level of education your mother completed? 1
No education
2 Primary incomplete
3 Primary complete
4 JSS/Middle School
5 Secondary
6 Training College (Nurse/Teaching)
7 College/university
8 Don't know
- 18 What was the highest level of education your father completed? 1
No education
2 Primary incomplete
3 Primary complete
4 JSS/Middle School
5 Secondary
6 Training College (Nurse/Teaching)
7 College/university
8 Don't know
- 19 What is your ethnic group/tribe? 1 ADANGBE
2 GA
3 DENKYIRA
4 FANTI
5 AHANTA
6 EWE
7 Ashanti
8 OTHER_____..

- 20 What is your religion?
- 1 Catholic
 - 2 Protestant
 - 3 Other Christian
 - 4 Muslim
 - 5 Traditional
 - 6 Other
 - 7 None
- 21 What is your current marital status?
- 1 Married
 - 2 Never married, in union (cohabit)
 - 3 Divorced
 - 4 Never married, not in union
 - 5 Widowed
- If 21 ne 1 then skip to 27
- 22 What was your age at first union or marriage?
- 23 How many co-wives do you have currently?
- 24 Are you the first, second, third, or more of your husband's current wives?
- 1 FIRST
 - 2 SECOND
 - 3 THIRD/HIGHER
- 25 Has your current husband/partner lived away from you for six months or more since you were married?
- 1 Yes
 - 2 No
- 26 Does your husband have children with any of your co-wives?
- 1 Yes
 - 2 No
- 27 Aside from your own housework, are you currently working?
- 1 Yes
 - 2 No
- 28 As you know, some people take up jobs for which they are paid in cash or kind. Others sell things, have small business or work on the family farm or in the family business. Others are in school. Are you currently doing any of these things or any other work?
- 1 Yes
 - 2 No
- 29 Have you done work in the last 12 months?
- 1 Yes
 - 2 No
- 30 What is your occupation, that is, what kind of work do you mainly do?

- 31 Do you have a husband or partner who is currently working? 1 Yes
2 No
- if no, skip to question 33
- 32 What is your husband/partner's occupation, that is, what kind of work does he do?
- 33 What is the main source of water for members of your household? 1 PIPED WATER (PIPED INTO HOUSE/YARD/ COMPOUND)
2 PUBLIC TAP, NEIGHBOR'S HOUSE
3 WELL WATER (WELL IN HOUSE/YARD/ COMPOUND)
4 PUBLIC WELL (OUTSIDE HOUSE, YARD, COMPOUND)
5 BOREHOLE
6 SURFACE WATER (SPRING, RIVER, STREAM, POND, LAKE, DAM, DUGOUT)
7 RAINWATER
8 TANKER TRUCK
9 OTHER _____
(SPECIFY)
- 34 What kind of toilet facility does your household normally use? 1 FLUSH TOILET (OWN WC)
2 SHARED WC
3 PIT TOILET/TRADITIONAL PIT LATRINE
4 VENTILATED IMPROVED PIT LATRINE
5 BUCKET/PAN
6 NO FACILITY (BUSH/FIELD)
7 OTHER _____
(SPECIFY)
- 35 Have you ever given birth? Please include any baby who cried or showed any sign of life, even if the baby only lived a few hours or days. 1 Yes
2 No
- 36 What is the total number of children you've given birth to ?
- 37 So I'm sure I have the number right, you have given birth to a total of children in your life? 1 Yes
2 No
- 38 Are you pregnant now? 1 Yes
2 No
99 DON'T KNOW

- 39 **[If respondent is not currently in union, omit]**
Have you resumed sleeping with (sexual intercourse) your husband/partner since the birth of your last child?
- 1 Yes
2 No
- 40 When you want to become pregnant, do you become pregnant quickly or does it take a long time?
- 1 QUICKLY
2 TAKES A LONG TIME
3 CAN NO LONGER BECOME PREGNANT
99 DON'T KNOW 99
- 41 In what year was your youngest child born?
- 42 In what month of that year was your youngest child born?
- 43 Would you like to have (a/another) child (with your husband/partner) or would you prefer not to have any (more) children (with him)?
- 1 WANTS A (ANOTHER) CHILD
2 WANTS NO MORE (NONE)
3 CANNOT GET PREGNANT
4 UNDECIDED
99 DON'T KNOW
- 44 How soon would you like to become pregnant?
- 1 AS SOON AS POSSIBLE 1
2 MONTHS: _____
3 YEARS: _____
4 OTHER: _____
(SPECIFY)
99 DON'T KNOW
- 45 **[If respondent has living child(ren):]**
If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?
- 1 IDEAL NUMBER
2 UP TO GOD
3 ALL EGGS IN BODY
4 OTHER _____
(SPECIFY)
99 DON'T KNOW
- [If respondent has no living children:]**
If you could choose exactly the number of children to have in your whole life, how many would that be?
- 1 IDEAL NUMBER
2 UP TO GOD
3 ALL EGGS IN BODY
4 OTHER _____
(SPECIFY)
99 DON'T KNOW

- 46 In general, would you say your health is:
- 1 Excellent
 - 2 Very Good
 - 3 Good
 - 4 Fair
 - 5 Poor
- 47 Overall, would you say that your health is better, about the same, or worse than (most) other women your age in this community?
- 1 BETTER
 - 2 THE SAME
 - 3 WORSE
- 48 Compared to one year ago, how would you rate your health in general now?
- 1 Much better now than one year ago
 - 2 Somewhat better now than one year ago
 - 3 About the same now as one year ago
 - 4 Somewhat worse now than one year ago
 - 5 Much worse now than one year ago
- 49a If R has had a live birth: Compared to your health at the time of your last birth, would you say that your health is currently:
Probe: Why?
- 1 Much better now
 - 2 Somewhat better now
 - 3 About the same now
 - 4 Somewhat worse now
 - 5 Much worse now
- 49b If R has never had a live birth: Compared to five years ago, how would you rate your health in general now?
Probe: Why?
- 1 Much better now
 - 2 Somewhat better now
 - 3 About the same now
 - 4 Somewhat worse now
 - 5 Much worse now
- 50 During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
- 1 Not at all
 - 2 Slightly
 - 3 Moderately
 - 4 Quite a bit
 - 5 Extremely
- 52 How true or false is each of the following statements for you?
- a I seem to get sick a little easier than other people
- 1 Definitely true

- | | | | |
|----|---|----|------------------|
| | | 2 | Mostly True |
| | | 3 | Mostly False |
| | | 4 | Definitely false |
| | | 5 | Don't know |
| b | I am as healthy as anybody I know | 1 | Definitely true |
| | | 2 | Mostly True |
| | | 3 | Mostly False |
| | | 4 | Definitely false |
| | | 5 | Don't know |
| c | I expect my health to get worse | 1 | Definitely true |
| | | 2 | Mostly True |
| | | 3 | Mostly False |
| | | 4 | Definitely false |
| | | 5 | Don't know |
| d | My health is excellent | 1 | Definitely true |
| | | 2 | Mostly True |
| | | 3 | |
| | | | Mostly False |
| | | 4 | Definitely false |
| | | 5 | Don't know |
| 52 | During the last 12 months, did you have any of these diseases? | | |
| a | AIDS | 1 | Yes |
| | | 2 | No |
| | | 99 | Don't Know |
| b | Gonorrhea | 1 | Yes |
| | | 2 | No |
| | | 99 | Don't Know |
| c | Syphilis | 1 | Yes |
| | | 2 | No |
| | | 99 | Don't Know |
| d | Genital warts | 1 | Yes |
| | | 2 | No |
| | | 99 | Don't Know |
| e | Other: | 1 | Yes |
| | | 2 | No |
| | | 99 | Don't Know |
| 53 | Which of the following illnesses have you suffered from in the past one year? | | |

- | | | |
|----|--|--|
| a | Fever | 1 Yes
2 No
99 Don't Know |
| b | Malaria | 1 Yes
2 No
99 Don't Know |
| c | Typhoid | 1 Yes
2 No
99 Don't Know |
| d | Cholera | 1 Yes
2 No
99 Don't Know |
| e | Diarrhea | 1 Yes
2 No
99 Don't Know |
| f | Cold/flu/throat infection | 1 Yes
2 No
99 Don't Know |
| g | Stomach ache | 1 Yes
2 No
99 Don't Know |
| h | Cough | 1 Yes
2 No
99 Don't Know |
| i | other: | 1 Yes
2 No
99 Don't Know |
| 54 | During the past year did you always receive medical care when you thought you needed it? | 1 Yes, all the time
2 Yes, sometimes
3 No, not at all
4 Never needed medical care |
| 55 | During the past year, have any of the following people hit, slapped, or physically hurt you on purpose (not as part of love-making)? | |
| a | Husband | 1 Yes
2 No |
| b | Other sexual partner | 1 Yes |

- 2 No
- c Father
1 Yes
2 No
- d Mother
1 Yes
2 No
- e Other male relative
1 Yes
2 No
- f Other female relative
1 Yes
2 No
- g Stranger
1 Yes
2 No
- h Other
1 Yes
2 No
- 56 Are you currently using a contraceptive method?
1 Yes
2 No
- If no skip to q58
- 57 Which method are you using?
1 Pill
2 IUD
3 Injections
4 Implants
5 Diaphragm/foam/jelly
6 Condom
7 Female sterilization
8 Male Sterilization
9 Natural methods
10 Withdrawl/rhythm
11 Other:
- 58 Would you say that it is very difficult, somewhat difficult, or not at all difficult for you to conceive a child?
1 Very difficult
2 Somewhat Difficult
3 Not at all Difficult
- 59 Would you say that a woman who has difficulties conceiving a child is likely to have more friends, fewer friends, or just as many friends as a woman who has children?
1 More Friends
2 Fewer Friends
3 Just as Many Friends

- 60 Would you say that a woman who has difficulties conceiving a child is more likely, less likely, or equally as likely to receive support from friends as a woman who has children?
- 1 More likely
 - 2 Less Likely
 - 3 Equally as Likely
- 61 Would you say that a woman who has difficulties conceiving a child is more likely, less likely, or equally as likely to receive support from neighbors as a woman who has children?
- 1 More likely
 - 2 Less Likely
 - 3 Equally as Likely
- 62 Would you say that a woman who has difficulties conceiving a child is more likely, less likely, or equally as likely to receive support from family members as a woman who has children?
- 1 More likely
 - 2 Less Likely
 - 3 Equally as Likely
- 63 How do members of your community respond if a woman has difficulties conceiving a child?
- 64 How do members of your community respond if a man is impotent or cannot have children with his wife?
- 65 Have you ever felt that you were treated differently due to difficulties conceiving?
- 66 If R has identified as infecund:
Do you think that your difficulties conceiving a child have had an impact on your health?

A.2 Coding Frequencies

Once the data were coded, frequencies for the mentions of each code were tallied. Positive and negative nodes were included for each count. These nodes do not indicate the respondent's assessment of whether the issue being discussed represents a beneficial or deleterious effect for infertile women; rather, the nodes indicate whether the respondent indicated that the topic was a salient issue (coded as a positive node) or was not a salient issue (coded as a negative node) in the case being discussed. For example, if a respondent mentioned that an infertile woman in the community had been insulted, her response was added to the positive node count for strained social interactions; if a respondent mentioned that she did not feel that infertile women were treated any differently than women with children, her response was added to the negative node count for strained social interactions. If the respondent mentioned both positive and negative instances, she was counted in both nodes.

Table A.2 shows a count of the women who mentioned each of the coded themes. The first and second columns provide the count tallies for each theme and percent within the coding category among women who identified as infertile; the third and fourth columns provide this information for women who reported no infertility, and the final column provides the total within each category. Counts of gender differences and strained social interactions are naturally higher, as all women were explicitly asked to reflect on each of these themes; however, tallies do not add to the full sample size of 107 due to "don't know" responses, which were not included in the counts. The frequencies presented in Table A.2 serve as a general overview of the patterns observed in the data; the detailed qualitative accounts presented in the text provide a more in-depth understanding of the thematic material contained within each code.

A total of 13 women mentioned the issue of marital instability in the course of the interviews; only one of these women did not identify as infertile. None of the women who mentioned the relationship between marriage and infertility suggested that infertility did not lead to marital instability (i.e. there were no negative mentions of marital instability). Mentions of infertile women being denied adult status were even more common: 22 women raised this issue, with only one nega-

Table A.1. Frequencies and Percentages for Qualitative Codes

	Infertile	%	No Infertility	%	Total
Marital Instability					
Positive	12	92.3	1	7.7	13
Negative	0	0.0	0	0.0	0
Adult Status					
Positive	17	77.3	4	18.2	21
Negative	0	0.0	1	4.5	1
Social Interactions					
Positive	58	59.8	24	24.7	82
Negative	9	9.3	6	6.2	15
Mental Health					
Positive	30	88.2	3	8.8	33
Negative	1	2.9	0	0.0	1
Physical Health					
Positive	35	74.5	3	6.4	38
Negative	5	10.6	4	8.5	9
Gender Differences					
Positive	38	43.2	19	21.6	57
Negative	19	21.6	12	13.6	31

tive mention. An overwhelming majority of both fertile and infertile women who discussed issues of adult status believe that infertility results in a denial of adult status. A majority of the women in the sample discussed the relationship between infertility and strained social interactions. The results for this category are mixed. A substantial minority of women (15.5%) suggested that infertile women are likely to experience strained social interactions. Although fertile women were slightly more likely to believe that infertility does not lead to strained social interactions, the difference is small.

Issues of both mental and physical health were also raised. With the exception of one woman, who believed that family and friends would provide support to an infertile woman, which would actually serve to increase her mental health, the women who spoke of mental health were in agreement that infertility generally leads to a reduction in mental health. A vast majority of the women who spoke to the issue were infertile. Similarly, the majority of women who mentioned the rela-

tionship between infertility and physical health were infertile. However, a minority of women (19.1%) believed that infertility does not cause a deterioration of physical health. In the case of gender differences, the positive node indicates women who believe that the experiences of men and women are different; a negative node indicates that the respondent did not think there are any gender differences. This code reflects the least agreement between women in the sample. While 64.8% of the women who spoke to this issue believed that male and female experiences with infertility differ, 45.2% saw no difference. Fertile women were somewhat more likely than infertile women to believe that there is no gender difference.

Appendix **B**

Cape Coast Data Guide

B.1 Content of Panel Survey Questionnaires

Social Learning, Social Influence and Fertility Control

POPULATION COUNCIL
AND
UNIVERSITY OF CAPE COAST

**CONTENT OF THE
PANEL SURVEY QUESTIONNAIRES**

Rounds 1 - 8

WOMEN

John Casterline
Doreen Totaram
14 April 2004

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FRONT PAGES

QUESTION	CATEGORIES	ROUND							
		1	2	3	4	5	6	7	8
RESPONDENT'S NAME		100	100	100	100	100	100	100	100
RESPONDENT'S POPULAR NAME (1)				100a	100a	100a	100a	100a	100a
RESPONDENT'S POPULAR NAME (2)				100b	100b	100b	100b	100b	100b
RESPONDENT'S IDENTIFICATION NUMBER		101	101	101	101	101	101	101	101
RESPONDENT'S AGE	□□			101a	101a	101a	101a	101a	101a
NAME OF HEAD OF HOUSEHOLD		102	102	102	102	102	102	102	102
HOUSE NUMBER		103	103	103	103	103	103	103	103
TOWN/VILLAGE		104	104	104	104	104	104	104	104
HUSBAND'S NAME (IF IN UNION)		105	105	105	105	105	105	105	
CURRENT HUSBAND'S POPULAR NAME				105a	105a	105a	105a	105a	105a
CURRENT HUSBAND'S NAME (IF IN UNION)									105
HUSBAND'S IDENTIFICATION NUMBER (IF IN SAMPLE)		106	106	106	106	106	106		
CURRENT HUSBAND'S IDENTIFICATION NUMBER								106	106
CURRENT MARITAL STATUS	IN UNION 1 MARRIED 2			106a	106a	106a	106a		106a
CURRENT MARITAL STATUS	NEVER MARRIED, NOT IN UNION 1 IN UNION 2 MARRIED 3 SEPARATED 4 DIVORCED 5 WIDOWED 6							106a	
INTERVIEWER'S NAME		111	111	111	111	111	111	111	111
INTERVIEWER'S IDENTIFICATION NUMBER		112	112	112	112	112	112	112	112
DATE OF LAST INTERVIEW			113	113	113	113	113		
DATE OF LAST INTERVIEW [Check background sheet.]								113	113

Interviewer Visits: For Visits 1-3

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Date of Visit:	____/____/____	113a-115a	113a-115a	113a-115a	113a-115a	113a-115a	113a-115a	113a-115a	113a-115a
Time of Interview: Start	____:____	113b-115b	113b-115b	113b-115b	113b-115b	113b-115b	113b-115b	113b-115b	113b-115b
Time of Interview: Ended	____:____	113c-115c	113c-115c	113c-115c	113c-115c	113c-115c	113c-115c	113c-115c	113c-115c
Status of Visit:	Complete 1 Incomplete 2 Refuses 3 Not Home 4 Other 5	113d-115d							
Status of Visit:	Complete 1 Incomplete 2 Refuses 3 Travelled 4 Other 5		113d-115d	113d-115d	113d-115d	113d-115d	113d-115d	113d-115d	113d-115d
Language of Interview:	GA/ADANGBE 1 TWI 2 FANTE 3 AHANTA 4 EWE 5 ENGLISH 6 OTHER 7 (SPECIFY)	116	116						
Language of Interview:	GA/ADANGBE 1 TWI 2 FANTE 3 AHANTA 4 EWE 5 ENGLISH 6 HAUSA 7			116	116	116	116	116	116
Supervisor's Initials	_____	117	117	117	117	117	117, 121	117, 121	117, 121
Editor's Initials	_____	118	118	118	118	118	118, 122	118, 122	118, 122
Data Entry Person's Initials	_____	119	119	119	119	119	123	123	123
Sent back to field?	NO 0 YES 1						119	119	119
Errors corrected	NO 0 YES 1						120	120	120

BACKGROUND

Household

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
What is the <u>main</u> source of water for members of your household?	PIPED WATER (PIPED INTO HOUSE/YARD/ COMPOUND) 1 PUBLIC TAP, NEIGHBOR'S HOUSE 2 WELL WATER (WELL IN HOUSE/YARD/ COMPOUND) 3 PUBLIC WELL (OUTSIDE HOUSE, YARD, COMPOUND) 4 BOREHOLE 5 SURFACE WATER (SPRING, RIVER, STREAM, POND, LAKE, DAM, DUGOUT) 6 RAINWATER 7 TANKER TRUCK 8 OTHER _____ 9 (SPECIFY)			200			200		200
How long does it take to go to the water source, get water, and bring it back?	HOURS 1 <input type="checkbox"/> MINUTES 2 <input type="checkbox"/> ON PREMISES 98 DON'T KNOW 99			201			201		201
What kind of toilet facility does your household <u>normally</u> use?	FLUSH TOILET (OWN WC) 1 SHARED WC 2 PIT TOILET/TRADITIONAL PIT LATRINE 3 VENTILATED IMPROVED PIT LATRINE 4 BUCKET/PAN 5 NO FACILITY (BUSH/FIELD) 6 OTHER _____ 7 (SPECIFY)			202			202		202
What is the main cooking fuel for the household?	WOOD 1 CHARCOAL 2 KEROSENE 3 ELECTRICITY 4 GAS 5			203			203		

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
What is the main cooking fuel for the household?	WOOD1 SAW DUST.....2 CHARCOAL.....3 KEROSENE.....4 ELECTRICITY5 GAS6 OTHER7 SPECIFY								203
What is the main material of the walls of the respondent's house?	PALM/WOOD PLANKS/ BAMBOO1 MUD/CLAY/SWISH2 LANDCRETE BLOCKS.....3 BURNT BRICKS4 CEMENT BLOCKS5 OTHER6 (SPECIFY)			204			204		204
Is the respondent's house connected to a source of electricity?	NO0 YES1			205			205		205
Household Items: Radio; Television; Video Cassette Recorder; Bicycle; Hand Truck; Motor Cycle; Motor Vehicle; Refrigerator; Sofa or Chair with Foam Pads; Bed with Foam Mattress									
Does household own the item?	NO0 YES1			206			206		206
Was item purchased in the last 12 months?	NO0 YES1 DON'T KNOW.....99			206			206		206
Does it usually work?	NO0 YES1			206			206		206
Respondent Characteristics									
How old are you?	Years Don't Know 99	200							
[Respondent knows age or is age estimated?]	RESPONDENT KNOWS AGE .1 AGE IS ESTIMATED2	201							
Where were you born?	IN THIS COMMUNITY1 RURAL AREA NEARBY2 RURAL AREA FAR.....3 URBAN AREA NEARBY.....4 URBAN AREA FAR5 OUTSIDE GHANA6	202							
Since age 15, have you lived away from this community 6 months or more?	NO0 YES1	203							
How long have you lived in this community?	LESS THAN ONE YEAR1 BETWEEN 1 AND 3 YEARS ...2 BETWEEN 3 AND 10 YEARS .3 MORE THAN 10 YEARS4	204							
Before you moved to this community, what type of place	RURAL AREA NEARBY1 RURAL AREA FAR.....2	205							

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
were you living in?	URBAN AREA NEARBY3 URBAN AREA FAR4 OUTSIDE GHANA5								
Since you moved to this community, have you lived away 6 months or more?	NO0 YES1	206							
What is your ethnicity?	ADANGBE1 GA2 DENKYIRA3 FANTI4 AHANTA5 EWE6 OTHER7 (SPECIFY)	207							
What language do you normally speak at home?	GA/ADANGBE1 TWI2 FANTE3 AHANTA4 EWE5 ENGLISH6 OTHER7 (SPECIFY)	208							
What other languages do you speak well enough to conduct private or personal matters? [CIRCLE ALL THAT APPLY]	NONE0 GA/ADANGBE1 TWI2 FANTE3 AHANTA4 EWE5 ENGLISH6 OTHER7 (SPECIFY)	209							
What is your religion?	NONE0 CATHOLIC1 ORTHODOX PROTESTANT2 MOSLEM3 SYNCRETIC4 PENTECOSTAL/ CHARISMATIC5 TRADITIONAL6 OTHER7 (SPECIFY)	210							
What is your current marital status?	NEVER MARRIED, NOT IN CURRENT UNION1 IN CURRENT UNION2 CURRENTLY MARRIED3 SEPARATED4 DIVORCED5 WIDOWED6	218	205	212	212	212			
To make sure that I understand, your current marital status is..... Is that correct? [Check the marital status calendar to make sure that what is reported here for Q. 212 is the same current marital status as in the calendar.]	NOT IN UNION1 IN UNION2 MARRIED3 SEPARATED4 DIVORCED5 WIDOWED6						212	212	212

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Other than your current/most recent husband/partner, were you ever married before?	NO0 YES1	218b							
[If currently married, in union, or ever married:] What was your age at first union or marriage?	AGE □□ DON'T KNOW.....99	219							
How many co-wives do you have currently?	NUMBER OF CO-WIVES □□	220	206	213	213	213	213	213	213
What is the name of your (first) co-wife/partner?	_____ (NAME)			213a	213a	213a	213a	213a	213a
What is the name of your second co-wife/partner?	_____ (NAME)			213b	213b	213b	213b	213b	213b
Are you the first, second or third/higher of your husband's current wives?	FIRST1 SECOND2 THIRD/HIGHER.....3	221	207	214	214	214	214	214	214
Do you live in the same compound as your co-wives?	NO0 YES1	222							
Do you live in the same compound as (any of) your co-wives?	NO0 YES1		208a	215a	215a	215a	215a	215a	215a
Does your partner/husband live in this compound?	NO0 YES1		208b	215b	215b	215b	215b	215b	215b
Where does your husband/partner stay or where can he be located?	_____ _____ _____						215c	215c	215c
Has your current husband/partner lived away from you for six months or more since you were married?	NO0 YES1	223							
Have you ever attended school?	NO0 YES1	211							
Has your new partner/husband ever attended school?	NO0 YES1 DON'T KNOW.....99		209	216	216	216	216	216	216
Has your current husband/partner ever attended school?	NO0 YES1 DON'T KNOW.....99	225							
What is the highest grade of schooling you have ever completed?	(SEE SCHOOLING CODE SHEET) _____ (CODE)	212							
What is the highest grade of schooling your new partner/husband has completed?	(SEE SCHOOLING CODE SHEET) _____ (CODE)		210	217	217	217	217	217	217
What is the highest grade of schooling your current husband/partner has completed?	(SEE SCHOOLING CODE SHEET) _____ (CODE)	226							
Have you ever had any schooling outside of this community?	NO0 YES1	213							
Where was this?	RURAL AREA NEARBY1	214							

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	RURAL AREA FAR.....2 URBAN AREA NEARBY.....3 URBAN AREA FAR.....4 OUTSIDE GHANA.....5								
Has your new partner/husband ever had any schooling outside of this community?	NO.....0 YES.....1 DON'T KNOW.....99		211	218	218	218	218	218	218
Has your current husband/partner ever had any schooling outside of this community?	NO.....0 YES.....1 DON'T KNOW.....99	227							
Where was this?	RURAL AREA NEARBY.....1 RURAL AREA FAR.....2 URBAN AREA NEARBY.....3 URBAN AREA FAR.....4 OUTSIDE GHANA.....5 DON'T KNOW.....99	228	212	219	219	219	219	219	219
Can you read and understand a newspaper in English easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3	215							
Can your new partner/husband read and understand English easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3 DON'T KNOW.....99		213	220	220	220	220		
Can your new partner/husband read English easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3 DON'T KNOW.....99							220	220
Can your current husband/partner read and understand a newspaper in English easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3 DON'T KNOW.....99	229							
Can you read and understand a newspaper in any Ghanaian language easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3	216							
Can your new partner/husband read and understand any Ghanaian language easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3 DON'T KNOW.....99		214	221	221	221	221		
Can your new partner/husband read any Ghanaian language easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3 DON'T KNOW.....99							221	221
Can your current husband/partner read and understand a newspaper in any Ghanaian language easily, with difficulty, or not at all?	EASILY.....1 WITH DIFFICULTY.....2 NOT AT ALL.....3 DON'T KNOW.....99	230							
Some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business, or work on the family farm or in the family business. Have you done any of these things or any work in the	NO.....0 YES.....1	233							

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
past year?									
Some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business, or work on the family farm or in the family business. Have you done any of these things or any work since the last interview?	NO0 YES1		217	225	225	225	225	225	225
What kind of work have you been doing?	(SEE EMPLOYMENT CODE SHEET) (CODE, SPECIFY IF OTHER)	234					225a	225a	225a
Is your main work for a member of your family, for someone else, for government or are you self-employed?	FOR FAMILY MEMBER.....1 FOR SOMEONE ELSE.....2 GOVERNMENT3 SELF EMPLOYED4	235					225b	225b	225b
Did anyone help you obtain this job or work, or provided money or other assistance for you to work?	NO0 YES1								225b1
Who helped you obtain this job or work or provided you money or other help?	RESPONDENT'S SPOUSE.....1 CO-WIFE2 SIBLING (BROTHER/SISTER) 3 OTHER FAMILY MEMBERS ...4 FRIEND, CONFIDANT.....5 OTHER6 (SPECIFY)								225b2
Who decides how your earnings will be spent?	RESPONDENT1 RESPONDENT'S SPOUSE....2 RESPONDENT AND SPOUSE JOINTLY3 RESPONDENT AND OTHER FAMILY MEMBER(S)4 OTHER FAMILY MEMBERS ...5 OTHER6 (SPECIFY)	236					225c	225c	225c
While you are working, do you spend most of your time with women, with men, with a mixture of both women and men or alone?	WITH WOMEN1 WITH MEN.....2 MIXED, WOMEN AND MEN...3 ALONE.....4	237					225d	225d	225d
Are these people mostly older than you, are most of them your agemates, are most of them younger than you, or is there a mixture of people of all ages?	MOSTLY OLDER.....1 MOSTLY AGEMATES2 MOSTLY YOUNGER.....3 MIXED AGES4	238					225e	225e	225e
Do you think the economic situation of your household is better, about the same, or worse than it was a year ago?	BETTER.....1 THE SAME2 WORSE3		223						
Compared to the last interview, do you think the economic situation of your household is better, about the same, or worse?	BETTER.....1 THE SAME2 WORSE3			231	231	231	231	231	231
Looking ahead, do you think the	BETTER.....1		224	232	232	232	232	232	232

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
economic situation of your household will be better, about the same, or worse in a year's time?	THE SAME2 WORSE3 UP TO GOD.....4 CAN'T TELL.....5								
Please explain why.	_____ _____ _____		225	233	233	233	233	233	233
Have you had any health problems or illnesses during the past year?	NO0 YES1		226						
Since the last interview, have you had any health problems or illnesses?	NO0 YES1			234	234	234	234	234	234
Were any of these problems or illnesses you had serious?	NO0 YES1		227	235	235	235	235	235	235
Overall, would you say that your health is better, about the same, or worse than at the time of the last interview?	BETTER.....1 THE SAME2 WORSE3		228	236	236	236	236	236	236
Overall, would you say that your health is better, about the same, or worse than (most) other women your age in this community?	BETTER.....1 THE SAME2 WORSE3		229						
Mass Media Exposure									
How often do you usually read a newspaper or magazine in any language?	NEVER1 AT LEAST ONCE PER MONTH.....2 AT LEAST ONCE PER WEEK.3 SEVERAL TIMES PER WEEK 4 DAILY5	217							
Since the last interview, how often have you read a newspaper?	NOT AT ALL1 ONCE/FEW TIMES2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK .6 (ALMOST) DAILY7			222a	222a	222a	222a	222a	222a
Have you read a family planning message in the newspaper since last interview?	NO0 YES1 DON'T REMEMBER99			222b	222b	222b	222b	222b	222b
In which newspaper(s) did you read that family planning message?	_____ (SPECIFY) DON'T REMEMBER99			222c	222c	222c	222c	222c	222c
What did that family planning message(s) say?	_____ (SPECIFY) DON'T REMEMBER99			222d	222d	222d	222d	222d	
[Probe for other themes]									
Since reading that family planning message(s), have you discussed it with someone else?	NO0 YES1			222e	222e	222e	222e	222e	
Since reading that/those family planning message(s), have you	NO0 YES1								222e

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
discussed it with someone else?									
Has someone else discussed with you a family planning message he/she read in the newspaper?	NO0 YES1			222f	222f	222f	222f	222f	222f
Since the last interview, have you read anything about HIV/AIDS in the newspaper?	NO0 YES1				222g	222g	222g		
[If Q.222a=1, go to Q.223a.] Since the last interview, have you read anything about HIV/AIDS in the newspaper?	NO0 YES1							222g	222g
How often do you listen to the radio?	NEVER1 AT LEAST ONCE PER MONTH.....2 AT LEAST ONCE PER WEEK.3 SEVERAL TIMES PER WEEK 4 DAILY5	231							
Since the last interview, how often have you listened to the radio?	NOT AT ALL1 ONCE/FEW TIMES SINCE LAST INTERVIEW2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6 (ALMOST) DAILY7		215	223a	223a	223a	223a	223a	223a
Have you heard a family planning message on the radio since last interview?	NO0 YES1 DON'T REMEMBER99			223b	223b	223b	223b	223b	223b
On what radio station(s) did you hear that family planning message?	_____ (SPECIFY) DON'T REMEMBER99			223c	223c	223c	223c	223c	223c
What was the name of the radio program(s)?	_____ (SPECIFY) DON'T REMEMBER99			223d	223d	223d	223d	223d	223d
What did that family planning message(s) say?	_____ (SPECIFY) DON'T REMEMBER99			223e	223e	223e	223e	223e	
[Probe for other themes]									
Since hearing that family planning message(s) on the radio, have you discussed it with someone else?	NO0 YES1			223f.	223f	223f	223f	223f	223f
Has someone else discussed with you a family planning message he/she heard on the radio?	NO0 YES1			223g	223g	223g	223g	223g	223g
Since the last interview, have you heard anything about HIV/AIDS on the radio?	NO0 YES1				223h	223h	223h		
[If Q.223a=1, go to Q.224a.] Since the last interview, have you heard anything about HIV/AIDS on the radio?	NO0 YES1							223h	223h
Have you heard a special "Love Life, Stop AIDS" song on the	NO0 YES1				223i	223i			

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
radio?									
Have you heard any people who have HIV/AIDS talking on the radio about the disease?	NO0 YES1				223j	223j	223j		223j
Since the last Interview, have you heard any people who have HIV/AIDS talking on the radio about the disease?	NO0 YES1							223j	
How often do you watch television?	NEVER1 AT LEAST ONCE PER MONTH.....2 AT LEAST ONCE PER WEEK.3 SEVERAL TIMES PER WEEK 4 DAILY5	232							
Since the last interview, how often have you watched television?	NOT AT ALL1 ONCE/FEW TIMES SINCE LAST INTERVIEW2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6 (ALMOST) DAILY7		216	224a	224a	224a	224a	224a	224a
Have you heard a family planning message on the television since last interview?	NO0 YES1 DON'T REMEMBER99			224b	224b	224b	224b	224b	224b
On what television station(s) did you hear that family planning message?	_____ (SPECIFY) DON'T REMEMBER99			224c	224c	224c	224c	224c	224c
What was the name of the television program?	_____ SPECIFY) DON'T REMEMBER99			224d	224d	224d	224d	224d	224d
[Probe for other themes] What did that family planning message(s) say?	_____ (SPECIFY) DON'T REMEMBER99			224e	224e	224e	224e	224e	
[Probe for other themes] Since hearing that family planning message(s) on television, have you discussed it with someone else?	NO0 YES1			224f	224f	224f	224f	224f	224f
Has someone else discussed with you a family planning message he/she heard on the television?	NO0 YES1			224g	224g	224g	224g	224g	224g
Since the last interview, have you heard or seen anything about HIV/AIDS on the television?	NO0 YES1				224h	224h	224h	224h	224h
Have you ever seen any of the following television adverts? [Read Each Description]									
Candles: Many candles burning and a male voice talking about 200 Ghanaians a day getting HIV/AIDS and asking are you protecting yourself.	NO0 YES1				224i1				

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Douglas: A Ghanaian man who has HIV talks in public about the disease.	NO0 YES1				224i2				
Paa Kwesi: A father and auntie talking about their son who died from HIV and that people should show compassion to those afflicted.	NO0 YES1				224i3				
Boys Night Out: Three boys in a bedroom talking about condom use.	NO0 YES1				224i4				
Sorry No Sex: A young man and woman in front of a gate who decide to wait for some time before they have sex.	NO0 YES1				224i5				
In the Dark: A young man and woman who argue about condom use after the lights have gone out, and the woman insists on condom use.	NO0 YES1				224i6				
Panther: Men and women in the disco and on a playing field. "Panther Condoms: If its not on, its not in."	NO0 YES1				224i7				
Have you ever seen this symbol/drawing anywhere? [Show Yellow Hand]	NO0 YES1				224j				
What does the symbol/drawing mean to you? [Don't Read]	Stop AIDS. Love Life1 Other2 (SPECIFY) DON'T KNOW99				224k				
Since the last Interview, have you heard or watched any people who have HIV/AIDS talking on the Television about the disease?	NO0 YES1							224j	
Have you heard or seen any people who have HIV/AIDS doing something on the Television?	NO0 YES1								224j
Since the last interview, have you heard or seen anything about HIV/AIDS in a community event?	NO0 YES1				224l				
Have you heard a talk by the Information Services Department vans about "Stop AIDS, Love Life?"	NO0 YES1				224m				
Have you seen the "Stop AIDS, Love Life" Road Show? [It is a truck with a stage, big yellow banners with the yellow hand and information, games, skits (drama) and a talk about AIDS].	NO0 YES1				224n				

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
<i>Geographical Mobility</i>									
How often during the past year did your work take you to other villages or towns?	NOT AT ALL1 ABOUT TWO TIMES A YEAR .2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6	239							
Since the last interview, how often has your work taken you to other villages or towns?	NOT AT ALL1 ONCE/FEW TIMES2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6		218	226	226	226	226	226	226
How often during the past year did you visit Accra for any reason?	NOT AT ALL1 ABOUT TWO TIMES A YEAR .2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6	240							
Since the last interview, how often have you visited Accra for any reason?	NOT AT ALL1 ONCE/FEW TIMES2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6		219	227	227	227	227	227	227
How often during the past year did you visit Takoradi, Kumasi, Cape Coast, or another city for any reason?	NOT AT ALL1 ABOUT TWO TIMES A YEAR .2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6	241							
Since the last interview, how often have you visited Takoradi, Kumasi, Cape Coast, Tema or another city/regional capital (other than Accra) for any reason?	NOT AT ALL1 ONCE/FEW TIMES2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6		220	228	228	228	228	228	228
How often during the past year did you visit a town for any reason?	NOT AT ALL1 ABOUT TWO TIMES A YEAR .2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6	242							
Since the last interview, how often have you visited a town for any reason?	NOT AT ALL1 ONCE/FEW TIMES2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER		221	229	229	229	229	229	229

BACKGROUND

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6								
How often during the past year did you visit another rural area for any reason?	NOT AT ALL1 ABOUT TWO TIMES A YEAR .2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6	243							
Since the last interview, how often have you visited another rural area for any reason?	NOT AT ALL1 ONCE/FEW TIMES2 ABOUT ONCE A MONTH.....3 SEVERAL TIMES PER MONTH.....4 ABOUT ONCE A WEEK5 MORE THAN ONCE A WEEK.6		222	230	230	230	230	230	230

Parental Family

What was the name of your parent or the person who mainly took care of you around the time you were age 15 [about the age of a JSS girl]?	_____				237a				
What kind of work was [guardian's name] doing around the time you were age 15 [about the age of a JSS girl]?	(SEE EMPLOYMENT CODE SHEET) _____ (CODE)				237b				
What was the highest grade of schooling [guardian's name] completed?	(SEE SCHOOLING CODE SHEET) _____ (CODE)				238				
Could [guardian's name] read English easily, with difficulty, or not at all?	EASILY1 WITH DIFFICULTY2 NOT AT ALL.....3 DON'T KNOW99				239				
Could [guardian's name] read any Ghanaian language easily, with difficulty, or not at all?	EASILY1 WITH DIFFICULTY2 NOT AT ALL.....3 DON'T KNOW99				240				
How many children did your mother ever give birth to, including yourself and those who are now dead?	CHILDREN.....□□	700							
How many of these children born to your mother ever reached age 15? [Check that respondent includes herself as one of the children.]	REACHED AGE 15.....□□	701							
How many of these children who reached age 15 are alive now?	CHILDREN ALIVE.....□□	702							
How many of these children who reached age 15 are dead?	CHILDREN DEAD.....□□	703							

CHILDBEARING AND POST-PARTUM BEHAVIORS

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Have you ever given birth? Please include any baby who cried or showed any sign of life, even if the baby only lived a few hours or days.	NO0 YES.....1	300							
The last time you were interviewed, you reported that you have given birth to a total of _____ children in your life. Is that correct?	NUMBER OF CHILDREN AT LAST INTERVIEW □□		300	300					
The last time you were interviewed, you reported that you took responsibility for a total of _____ foster children. Is that correct?	NUMBER OF FOSTER CHILDREN □□ AT LAST INTERVIEW			301					
How many children have you given birth to since the last interview?	NUMBER OF CHILDREN SINCE LAST INTERVIEW ... □□		301						
What is the total number of children you've given birth to (including those you had at last interview and the births you've had since then)?	NUMBER OF CHILDREN □□		302						
How many of the living children do not live with you?	CHILDREN AWAY □□		305						
Do you take responsibility for any children you did not give birth to and your husband did not father, who have been fostered into this household?	NO0 YES.....1		306						
How many of these children are now living with you?	CHILDREN AT HOME □□	301	304						
How many of these children are alive, but do not live with you?	CHILDREN AWAY □□	302							
How many of the living children do not live with you?	CHILDREN AWAY □□								
How many of these children have died?	DEAD CHILDREN □□	303	303						
So I'm sure I have the number right, you have given birth to a total of children in your life?	TOTAL BIRTHS □□	304							
Do you take responsibility for any children you did not give birth to and your husband did	NO0 YES.....1	308							

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
not father, who have been fostered into this household?									
How many foster boys live in this household?	FOSTER BOYS □□	309							
How many foster girls live in this household?	FOSTER GIRLS □□	310							
So that means there are _____ foster children living in this household.	FOSTER TOTAL..... □□	311							
How many foster children live in this household?	FOSTER CHILDREN □□	307	307						
Have you given birth in the last three years to a baby who is still alive?	NO 0 YES..... 1	312							
How long ago did you give birth to your last living child? [Try to determine number of months.]	MONTHS 1 □□ YEARS..... 2 □□	313							
Are you pregnant now?	NO 0 YES..... 1 DON'T KNOW..... 99	316							
Are you currently breastfeeding that child?	NO 0 YES..... 1	313b							
Has your menstrual period returned since the birth of [NAME, your most recent birth]?	NO 0 YES..... 1		324	376					
Has your menstrual period returned since your most recent birth outcome?	NO 0 YES..... 1				323	323	323	323	323
For how long after your most recent birth outcome did you not have a menstrual period? [Try to determine the number of months.]	MONTHS 1 □□ YEARS..... 2 □□				324	324	324	324	324
For how long after the birth of [NAME, your most recent birth] did you not have a menstrual period? [Try to determine the number of months.]	MONTH..... 1 □□ YEARS..... 2 □□		325	377					
[If respondent is not currently in union, omit] Have you resumed sleeping with (sexual intercourse) your husband/partner since the birth of your last child?	NO 0 YES..... 1	314							
How many times did you sleep with your husband/partner in the last month?	NUMBER OF TIMES □□ DON'T KNOW..... 99	322	352	378	325	325	325	325	325
Have you and your husband/partner stopped having sexual intercourse?	NO 0 YES..... 1	323							
Have you and your husband/partner stopped sleeping together permanently?	NO 0 YES..... 1 DON'T KNOW..... 99		353	379	326	326	326	326	326
When you want to become pregnant, do you become	QUICKLY 0 TAKES A LONG TIME 1	315					408	408	408

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
pregnant quickly or does it take a long time?	CAN NO LONGER BECOME PREGNANT2 DON'T KNOW99								
[If respondent is not currently in union, omit references to husband/partner] Suppose you (and your husband/partner) have sexual intercourse in the next month: what is the chance that you would become pregnant on a scale of 0 to 10, with zero meaning no chance of getting pregnant and ten meaning you would certainly become pregnant.	CHANCE OF BECOMING PREGNANT <input type="checkbox"/> <input type="checkbox"/> DON'T KNOW99	317							
CHILD HISTORIES -- FOR OWN CHILDREN, 1-20									
NOW I WOULD LIKE YOU TO TELL ME ABOUT ALL OF YOUR OWN CHILDREN, WHETHER STILL ALIVE OR NOT, STARTING WITH THE FIRST ONE YOU HAD. [If twin or more, each child gets its own column.]									
What official name was given to your [first, next] baby?	NAME _____		309a-309f						
By what popular name is the [first, next] child known?	POPULAR NAME _____		310a-310f						
Was [name] born single, a twin, or a triplet/or more	SINGLE 1 TWIN OR MORE2		311a-311f						
Was [name] a boy or a girl?	BOY 1 GIRL2		312a-312f						
In what month and year was [name] born?	MONTH <input type="checkbox"/> <input type="checkbox"/> YEAR <input type="checkbox"/> <input type="checkbox"/> DON'T KNOW999		313a-313f						
Was [name's] birth a difficult delivery?	NO0 YES 1		314a-314f						
Is [name's] father your current husband, a previous husband, or another man?	CURRENT HUSBAND/PARTNER 1 PREVIOUS HUSBAND/PARTNER2 ANOTHER MAN3		315a-315f						
Is [name] still alive?	NO0 YES 1		316a-316f						
How old was [name] when s/he died? [Record days if less than one month, months if less than 2 years, or years.]	DAYS 1 <input type="checkbox"/> <input type="checkbox"/> MONTHS 2 <input type="checkbox"/> <input type="checkbox"/> YEARS 3 <input type="checkbox"/> <input type="checkbox"/> DON'T KNOW99		317a-317f						
Is [name] living with you now?	NO0 YES 1		319a-319f						
ASK SCHOOLING ITEMS ONLY FOR CHILDREN AGES 6 AND ABOVE.									

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Did [name] ever attend primary school?	NO 0 YES..... 1 DON'T KNOW..... 99		320a- 320f						
Is [name] currently enrolled in school?	NO 0 YES..... 1 DON'T KNOW..... 99		321a- 321f						
At what age did [name] leave school?	AGE □□ DON'T KNOW..... 99		322a- 322f						
What is the highest level of schooling that [name] has completed?	(SEE SCHOOLING CODE SHEET) _____ (CODE)		323a- 323f						
<p>CHILD HISTORIES -- FOR FOSTER CHILDREN, 1-6</p> <p>NOW I WOULD LIKE YOU TO TELL ME ABOUT ALL OF THE CHILDREN YOU DID NOT GIVE BIRTH TO AND WHO YOUR HUSBAND DID NOT FATHER, BUT WHO YOU TAKE RESPONSIBILITY FOR, STARTING WITH THE OLDEST</p>									
What official name was given to the [first, next] fostered-in child?	NAME _____		326a- 326f						
By what popular name is the [first, next] fostered-in child known?	POPULAR NAME _____		327a- 327f						
Is [name] a boy or a girl?	BOY 1 GIRL 2		328a- 328f						
Is [name] your kin, your husband's kin, or non-kin?	RESPONDENT'S KIN..... 1 HUSBAND'S KIN 2 NON-KIN..... 3		329a- 329f						
Is [name's] natural father alive?	NO 0 YES..... 1 DON'T KNOW..... 99		330a- 330f						
Is [name's] natural mother alive?	NO 0 YES..... 1 DON'T KNOW..... 99		331a- 331f						
How old was [name] at his/her last birthday?	YEARS..... □□ DON'T KNOW..... 99		332a- 332f						
<p>[Record age in completed Years.]</p>									
ASK SCHOOLING ITEMS ONLY FOR CHILDREN AGES 6 AND ABOVE.									
Did [name] ever attend primary school?	NO 0 YES..... 1 DON'T KNOW..... 99		333a- 333f						
Is [name] currently enrolled in school?	NO 0 YES..... 1		334a- 334f						
At what age did [name] leave school?	AGE □□ DON'T KNOW..... 99		335a- 335f						
What is the highest level of schooling that [name] has completed?	(SEE SCHOOLING CODE SHEET) _____ (CODE)		336a- 336f						

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
CHILDREN'S UPDATE -- FOR CHILDREN ALIVE AT LAST INTERVIEW, 1-20									
In what year was [Child] born?	301a1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							301a1	
In what month of that year was [child] born?	301a2 <input type="checkbox"/> <input type="checkbox"/>							301p1 301a2 301p2	
Is [child] alive?	NO0 YES.....1			302a- 302p				302a- 302p	
In what month did [child] die?	MAY 991 JUNE 99.....2 JULY 99.....3 AUG. 99.....4 SEPT. 99.....5 OCT. 99.....6 NOV. 99.....7 DEC. 99.....8 JAN. 00.....9 FEB. 00.....10 MAR. 00.....11 APR. 00.....12 MAY 00.....13			303a- 303p					
In what year did [Child] die?	303a1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							303a1	
In what month of that year did [child] die?	303a2 <input type="checkbox"/> <input type="checkbox"/> [GO TO NEXT CHILD OR Q. 318]							303p1 303a2 303p2	
Is [child] living with you?	NO0 YES.....1			304a- 304p				304a- 304p	
Since the last interview, has [child] had any serious health problems or illnesses?	NO0 YES.....1 DON'T KNOW.....99			305a- 305p				305a- 305p	
How old was [child] at his/her last birthday?	YEARS..... <input type="checkbox"/> <input type="checkbox"/>			306a- 306p					
Has [child] ever attended school?	NO0 YES.....1			307a- 307p					
Has [child] ever attended Primary school?	NO0 →GO TO Q.313a YES.....1							307a- 307p	
Is [child] currently enrolled in school?	NO0 YES.....1			310a- 310p				310a- 310p	
Has [child] completed his/her schooling?	NO0 YES.....1 DON'T KNOW.....99			311a- 311p				311a- 311p	
How old was [child] when [child] left school?	YEARS..... <input type="checkbox"/> <input type="checkbox"/>							311aa - 311ap	
What is the highest grade of schooling [child] has completed? [See schooling code sheet.]	_____			312a- 312p				312a- 312p	
What grade of schooling do you				313a-				313a- 313p	

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
think will be or would have been adequate for [child]? [See schooling code sheet.]	_____			313p					
Do you think you will be able to look after [child] to that grade?	NO0 YES.....1 IT DEPENDS2 DON'T KNOW99			314a- 314p					
[If Q. 311 = 1, go to Q. 315] Do you think you will be or would have been able to look after [child] to that grade?	[If Q. 311a = 1, go to Q. 315a] NO0 YES.....1 IT DEPENDS2 DON'T KNOW99							314a- 314p	
Since the last interview, has [child] worked on a family farm or in a family business?	NO0 YES.....1 DON'T KNOW99			315a- 315p					
[If child was born after January 1997, go to Q.301 or Foster Children Update] Since the last interview, has [child] worked on a family farm or in a family business e.g., Fishing?	[If child was born after January 1997, go to Q.301b or Foster Children Update] NO0 YES.....1 DON'T KNOW99							315a- 315p	
Since the last interview, has [child] worked for pay (in cash or kind) on a farm/business owned by someone else (not a family farm/business)?	NO0 YES.....1 DON'T KNOW99			316a- 316p				316a- 316p	
Since the last interview, would you say that [child] often, seldom, or almost never missed a day of school in order to work?	OFTEN.....1 SELDOM.....2 ALMOST NEVER3 DON'T KNOW99			317a- 317p				317a- 317p	
FOSTER CHILDREN UPDATE: -- For Foster Children Alive at Last Interview 1-6									
Do you still take responsibility for [child]?	NO0 YES.....1			318a- 318f				318a- 318f	
Is [child] alive?	NO0 YES.....1			319a- 319f				319a- 319f	
In what month did [child] die?	MAY 991 JUNE 99.....2 JULY 993 AUG. 994 SEPT. 99.....5 OCT. 996 NOV. 997 DEC. 998 JAN. 009 FEB. 00.....10 MAR. 0011 APR. 00.....12 MAY 0013			320a- 320f					
In what year did [Child] die?	303a1 □□□□							303a1- 303f1	
In what month of that year did	303a2 □□							303a2	

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D								
		1	2	3	4	5	6	7	8	
[child] die?	DON'T KNOW.....99 [GO TO NEXT FOSTER CHILD OR NEW FOSTER CHILDREN]								-303f2	
Is [child] living with you?	NO0 YES.....1			321a-321f					321a-321f	
Since the last interview, has [child] had any serious health problems or illnesses?	NO0 YES.....1			322a-322f					322a-322f	
How old was [child] at his/her last birthday?	YEARS.....□□ DON'T KNOW.....99			323a-323f					323a-323f	
Has [child] ever attended school?	NO0 YES.....1			324a-324f						
Has [child] ever attended Primary school?	NO0 →GO TO Q.328a YES.....1								324a-324f	
Is [child] currently enrolled in school?	NO0 YES.....1			325a-325f					325a-325f	
Has [child] completed his/her schooling?	NO0 YES.....1			326a-326f					326a-326f	
What is the highest grade of schooling [child] has completed?	_____			327a-327f					327a-327f	
[See schooling code sheet.]										
What grade of schooling do you think will be or would have been adequate for [child]?	_____			328a-328f					328a-328f	
[See schooling code sheet.]	[If "99" (Don't Know"), go to Q. 330a.]									
Do you think you will be able to look after [child] to that grade?	NO0 YES.....1 IT DEPENDS2 DON'T KNOW.....99			329a-329f					329a-329f	
Since the last interview, has [child] worked on a family farm or in a family business?	NO0 YES.....1			330a-330f						
[If child is less than 6 years old, go to Q.318 or NEW FOSTER CHILDREN.]	[If child is less than 6 years old, go to Q.318b or NEW FOSTER CHILDREN.]								330a-330f	
Since the last interview, has [child] worked on a family farm or in a family business e.g., Fishing?	NO0 YES.....1									
Since the last interview, has [child] worked for pay (in cash or kind) on a farm/business owned by someone else (not a family farm/business)?	NO0 YES.....1 DON'T KNOW.....99			331a-331f					331a-331f	
Since the last interview, would you say that [child] often, seldom, or almost never missed a day of school in order to work?	OFTEN.....1 SELDOM.....2 ALMOST NEVER.....3 DON'T KNOW.....99			332a-332f					332a-332f	
How many children have you given birth to since the last interview?	NUMBER OF CHILDREN.....□□			333						

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
[Include all live births, even if the child lived only a few hours/days.]	SINCE LAST INTERVIEW								
How many children to whom you did not give birth and your husband did not father have been fostered into this household <u>since</u> the last interview?	NUMBER OF FOSTER CHILDREN..... <input type="checkbox"/> <input type="checkbox"/> SINCE LAST INTERVIEW			334					
<p>FOSTER CHILDREN UPDATE: <i>For New Foster Children 1-6</i></p> <p>Now I would like you to tell me about all of the children you did not give birth to and who your husband did not father, but for whom you have taken responsibility <u>since the last interview</u>, starting with the oldest.</p>									
What official name was given to the [first, next] fostered-in child?	NAME _____			335a-335f				335a-335f	
By what popular name is [child] known?	POPULAR NAME _____			336a-336f				336a-336f	
Is [child] a boy or a girl?	BOY1 GIRL2			337a-337f				337a-337f	
Is [child] your kin, your husband's kin, or non-kin?	RESPONDENT'S KIN1 HUSBAND'S KIN2 NON-KIN3			338a-338f				338a-338f	
Is [child's] natural father alive?	NO0 YES1 DON'T KNOW99			339a-339f				339a-339f	
Is [child's] natural mother alive?	NO0 YES1 DON'T KNOW99			340a-340f				340a-340f	
Since you took responsibility for [child] has he/she had any serious health problems or illnesses?	NO0 YES1			341a-341f				341a-341f	
How old was [child] at his/her last birthday? [Record age in completed Years.]	YEARS..... <input type="checkbox"/> <input type="checkbox"/> DON'T KNOW99			342a-342f				342a-342f	
Did [child] ever attend school?	NO0 YES1 DON'T KNOW99			343a-343f					
Did [child] ever attend Primary school?	NO0 →GO TO Q. 348a YES1 DON'T KNOW99 →GO TO Q. 348a							343a-343f	
Is [child] currently enrolled in school?	NO0 YES1			344a-344f				344a-344f	

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
At what age did [child] leave school?	AGE. □□ DON'T KNOW99			345a- 345f				345a- 345f	
Has [child] completed his/her schooling?	NO0 YES.....1 DON'T KNOW99			346a- 346f				346a- 346f	
What is the highest grade of schooling that [child] has completed? [See schooling Code sheet]	_____ (CODE)			347a- 347f				347a- 347f	
What grade of schooling do you think will be or would have been adequate for [child]? [SEE SCHOOLING CODE SHEET.]	_____ [If "99" (Don't Know"), go to Q. 350a.]			348a- 348f				348a- 348f	
Do you think you will be able to look after [child] to that grade?	NO0 YES.....1 IT DEPENDS2 DON'T KNOW99			349a- 349f				349a- 349f	
Since the last interview, has [child] worked on a family farm or in a family business?	NO0 YES.....1			350a- 350f					
[If child is less than 6 years old, go to Q.335 or Section 4.] Since the last interview, has [child] worked on a family farm or in a family business?	[If child is less than 6 years old, go to Q.335b or Section 4.] NO0 YES.....1							350a- 350f	
Since the last interview, has [child] worked for pay (in cash or kind) on a farm/business owned by someone else (not a family farm/business)?	NO0 YES.....1 DON'T KNOW99			351a- 351f				351a- 351f	
Since the last interview, would you say that [child] often, seldom, or almost never missed a day of school in order to work?	OFTEN1 SELDOM.....2 ALMOST NEVER3 DON'T KNOW99			352a- 352f				352a- 352f	

Childbearing and Post-partum

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
For Births Occurring Between Interviews									
What official name was given to your baby?	NAME:			371	318	318			
What name was given to your baby?	NAME:						318a 318b	318a- 318b	318a- 318b
Was [name] born single, a twin, or a triplet/or more?	SINGLE1 TWIN OR MORE.....2			372	319	319	319a 319b	319a- 319b	319a- 319b
Was [name] a boy or a girl?	BOY1 GIRL2			373	320	320	320a 320b	320a- 320b	320a- 320b
Is [name] still alive?	NO0 YES.....1			374	321	321	321a 321b	321a- 321b	321a- 321b
In what month and year did [name] die?	< month >			375	322	322			
In what month did [name] die?							322a 322b	322a- 322b	322a- 322b
Is [Name] living with you?	NO0 YES.....1							322aa - 322ab	
Since the [Date of Birth], has [Name] had any serious health problems or illness?	NO0 YES.....1 DON'T KNOW99 [GO TO Q.318b OR Q. 323.]							322ba - 322bb	

FERTILITY ATTITUDES

Fertility Preferences

Fertility Attitudes

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Would you like to have (a/another) child (with your husband/partner) or would you prefer not to have any (more) children (with him)?	WANTS A (ANOTHER) CHILD 1 WANTS NO MORE (NONE)2 CANNOT GET PREGNANT.....3 UNDECIDED.....4 DON'T KNOW99	318	400	400	400	400	400	400	400
How soon would you like to become pregnant?	AS SOON AS POSSIBLE1 MONTHS2 <input type="checkbox"/> <input type="checkbox"/> YEARS.....3 <input type="checkbox"/> <input type="checkbox"/> OTHER 4 (SPECIFY) DON'T KNOW99	319	401	401	401	401	401	401	401
[If respondent is not currently in union, omit] Would your husband/partner like to have (a/another) child with you, or would he prefer not to have any (more) children?	WANTS A (ANOTHER) CHILD 1 WANTS NO MORE (NONE)2 UNDECIDED.....3 DON'T KNOW99	320	402	402	402	402	402	402	402
How soon would your husband/partner like you to become pregnant (again)?	AS SOON AS POSSIBLE1 MONTHS2 <input type="checkbox"/> <input type="checkbox"/> YEARS.....3 <input type="checkbox"/> <input type="checkbox"/> OTHER 4 (SPECIFY) DON'T KNOW99	321	403	403	403	403	403	403	403
After the birth of the child you are currently pregnant with, would you like to have another child or would you prefer not to have any more children?	WANTS ANOTHER CHILD.....1 WANTS NO MORE2 UNDECIDED.....3 DON'T KNOW99	324	404	404	404	404	404	404	404
After the birth of the child you are currently pregnant with, how soon would you like to become pregnant again?	AS SOON AS POSSIBLE1 MONTHS2 <input type="checkbox"/> <input type="checkbox"/> YEARS.....3 <input type="checkbox"/> <input type="checkbox"/> OTHER 4 (SPECIFY) DON'T KNOW99	325	405	405	405	405	405	405	405
[If respondent is not currently in union, omit] After the birth of the child you are currently pregnant with, would your husband/partner like to have another child with you, or would he prefer not to have any more children?	WANTS ANOTHER CHILD.....1 WANTS NO MORE2 UNDECIDED.....3 DON'T KNOW99	326	406	406	406	406	406	406	406
After the birth of the child you are currently pregnant with, how soon would you like to become pregnant again?	AS SOON AS POSSIBLE1 MONTHS2 <input type="checkbox"/> <input type="checkbox"/>	327	407	407	407	407	407	407	407

Fertility Attitudes

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
soon would your husband/partner like you to become pregnant again?	YEARS.....3 <input type="checkbox"/> OTHER.....4 (SPECIFY) DON'T KNOW.....99								
[If respondent has living child(ren):] If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?	IDEAL NUMBER..... <input type="checkbox"/> UP TO GOD.....96 ALL EGGS IN BODY.....97 OTHER.....98 (SPECIFY) DON'T KNOW.....99	400							
[If respondent has no living children:] If you could choose exactly the number of children to have in your whole life, how many would that be?	IDEAL NUMBER..... <input type="checkbox"/> UP TO GOD.....96 ALL EGGS IN BODY.....97 OTHER.....98 (SPECIFY) DON'T KNOW.....99	401							
Costs and Benefits of Children									
[If respondent is not currently in union, omit references to husband/partner] Suppose you (and your husband/partner) were anticipating the costs of feeding and clothing a/another child: how costly would a/another child be on a scale of 0 to 10, with 0 meaning feeding and clothing the child would have no costs, and 10 meaning feeding and clothing the child would be extremely costly?	(0-10)	402			408		421		421
Suppose you (and your husband/partner) were anticipating the costs of educating a/another child: how costly would a/another child be on a scale of 0 to 10, with 0 meaning educating the child would have no costs, and 10 meaning educating the child would be extremely costly?	(0-10)	403			409		422		422
Suppose you (and your husband/partner) were anticipating the demands of a/another pregnancy and birth on your health: how demanding would this be on a scale of 0 to 10, with 0 meaning a/another pregnancy and birth would make no demands on your	(0-10)	404			410		423		423

Fertility Attitudes

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
health, and 10 meaning a/another pregnancy and birth would be extremely demanding on your health?									
Suppose you (and your husband/partner) were anticipating the labor contribution of a/another child to this household: how helpful would a/another child be on a scale of 0 to 10, with 0 meaning the child would make no labor contribution, and 10 meaning the child would be extremely helpful to the household?	Boy (0-10) Girl (0-10)	405							
Suppose you (and your husband/partner) were anticipating the support a/another child would provide you in your old age: how supportive would a/another child be on a scale of 0 to 10, with 0 meaning the child would provide no support, and 10 meaning the child would be extremely supportive in your old age?	Boy (0-10) Girl (0-10)	406							
[If respondent is not currently in union, omit] During the past year, have you discussed the costs and benefits of having a/another child with your husband/partner?	NO0 YES.....1 DON'T KNOW99	407							
During the past year, have you discussed the costs and benefits of having a/another child with any relatives?	NO0 YES.....1 DON'T KNOW99	408							
During the past year, have you discussed the costs and benefits of having a/another child with any friends?	NO0 YES.....1 DON'T KNOW99	409							
[If respondent is not currently in union/married, omit] Since the last interview, have you discussed the costs and benefits of having a/another child with your partner/husband?	NO0 YES.....1		418	408	418	418	418		418
Since the last interview, have you discussed the costs and benefits of having a/another child with any relatives?	NO0 YES.....1		419	409	419	419	419		419
Since the last interview, have you discussed the costs and benefits of having a/another child with any friends?	NO0 YES.....1		420	410	420	420	420		420
With the high cost of SSS these days, it's <u>not rewarding</u> to send your children to SSS.	STRONGLY AGREE.....1 AGREE (a little).....2 NO OPINION3		408		411		409		409

Fertility Attitudes

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	DISAGREE (a little).....4 STRONGLY DISAGREE.....5								
It's difficult to get a good job these days <u>unless you have completed</u> SSS or higher.	STRONGLY AGREE.....1 AGREE (a little).....2 NO OPINION3 DISAGREE (a little).....4 STRONGLY DISAGREE.....5		409		412		410		410
Parents <u>cannot afford</u> to send their children to SSS if they have many children.	STRONGLY AGREE.....1 AGREE (a little)2 NO OPINION3 DISAGREE (a little)4 STRONGLY DISAGREE.....5		410		413		411		411
The longer a child stays in school, <u>the less helpful</u> the child will be to his parents in the future, after s/he finishes school.	STRONGLY AGREE.....1 AGREE (a little).....2 NO OPINION3 DISAGREE (a little).....4 STRONGLY DISAGREE.....5		411						
Thinking back to 10 years ago, did second cycle education (old system and SSS) graduates in those days find better jobs, worse jobs, or about the same jobs as they can find these days?	BETTER JOBS1 WORSE JOBS2 ABOUT THE SAME3 IT DEPENDS4 DON'T KNOW99		412		414		412		
Thinking back to 15 years ago, did second cycle education (old system and SSS) graduates in those days find better jobs, worse jobs, or about the same jobs as they can find these days?	BETTER JOBS1 WORSE JOBS2 ABOUT THE SAME3 IT DEPENDS4 DON'T KNOW99								412
Please explain.			413						
Do you know of anybody in this area who has completed JSS or middle school and has found a good job?	NO0 YES.....1		414						
Do you know of anybody from this area who went to University?	NO0 YES.....1		415		415				
Have any of them completed University?	NO0 YES.....1 DON'T KNOW99		416		416				
Were any of those children able to get good jobs? (R4: "children" = "graduate")	NO0 YES.....1 DON'T KNOW99		417		417				

CONTRACEPTION: KNOWLEDGE, ATTITUDES, AND PRACTICES

Contraception: Knowledge, Attitudes, and Practices

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Do you approve or disapprove of couples using any means to space births or avoid pregnancy?	APPROVE.....1 DISAPPROVE.....2 DON'T KNOW.....99	500	500	500	500	500	500	500	500
[If respondent is not currently in union/married, omit] Do you think your husband/partner approves or disapproves of couples using any means to space births or avoid pregnancy?	APPROVES1 DISAPPROVES2 DON'T KNOW99	501	501	501	501	501	501	501	501
Have you ever discussed means to space births or avoid pregnancy with your husband/partner?	NO0 YES.....1 DON'T KNOW.....99	502							
Since the last interview, have you discussed means to space births or avoid pregnancy with your husband/partner?			502	502	502	502	502	502	502
Have you ever talked to anyone who encouraged you to use any method to space births or avoid pregnancy?	NO0 YES.....1	507							
Since the last interview, have you talked to anyone who encouraged you to use <u>any</u> method (modern or traditional) to space births or avoid pregnancy?	NO0 YES.....1		503	503	503	503	503	503	503
Have you talked to anyone who discouraged you from using any method to space births or avoid pregnancy?	NO0 YES.....1	508							
Since the last interview, have you talked to anyone who discouraged you from using <u>any</u> method (modern or traditional) to space births or avoid pregnancy?	NO0 YES.....1		504	504	504	504	504	504	504
Do you know of people in this community who oppose modern contraception?	NO0 YES.....1						505	506	505
Who are these people? What is their relationship to you? [CIRCLE ALL THAT APPLY]	FRIEND.....1 RELATIVE.....2 WORKMATE.....3 PASTOR/PRIEST4 FAMILY PLANNING/ HEALTH WORKER.....5 OTHER6						506	506	506

**Contraception: Knowledge,
Attitudes, and Practices**

QUESTION	CATEGORIES (SPECIFY)	R O U N D							
		1	2	3	4	5	6	7	8
Do you think there are some people within the community who will call you bad names or shun your company if you should use a modern contraceptive?	NO0 YES.....1 DON'T KNOW99						507	507	507
Do you think there are some people within this community who will praise, encourage, or talk favorably about you if you should use modern contraception?	NO0 YES.....1 DON'T KNOW99						508	508	508
Current Use									
[Check month of current interview in contraceptive calendar above]. So that I'm clear, the contraceptive method(s) you and your husband are <u>currently</u> using is <method(s)>?	NOT USING 0 PILL 1 INJECTION 2 FOAM/JELLY/ DIAPHRAGM..... 3 CONDOM 4 IUD 5 FEMALE STERILIZATION 6 MALE STERILIZATION..... 7 RHYTHM/PERIODIC ABSTINENCE 8 WITHDRAWAL..... 9 HERBS..... 10 NORPLANT 11		536	517	524	524	524	524	524
First Use									
[If respondent is not currently in union, omit reference to husband] Now I'd like to ask you about the <u>first time</u> you (or your husband/partner) did something or used a method to avoid getting pregnant. What did you do or what method did you use the <u>first</u> time? [CIRCLE ALL THAT APPLY]	PILL1 INJECTION2 DIAPHRAGM/FOAM/JELLY ...3 CONDOM.....4 IUD.....5 FEMALE STERILIZATION6 MALE STERILIZATION7 PERIODIC ABSTINENCE8 POST-PARTUM ABSTINENCE9 WITHDRAWAL10 HERBS.....11 NORPLANT12 OTHER 13 (SPECIFY) DON'T KNOW99	509							
How long ago was this <u>first</u> use of (method)?	WITHIN THE LAST YEAR0 1 YEAR AGO1 2 YEARS AGO2 3 YEARS AGO3 4 YEARS AGO4 5 YEARS AGO5	510							

**Contraception: Knowledge,
Attitudes, and Practices**

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	MORE THAN 5 YEARS AGO ..6 DON'T KNOW99								
[If respondent is not currently in union, omit references to husband/partner] Before you (or your husband/partner) decided to use (method), did either of you talk to someone else who encouraged you to do so or did you decide to use this method without receiving others' encouragement?	RECEIVED ENCOURAGEMENT.....1 DIDN'T RECEIVE ENCOURAGEMENT.....2 DON'T KNOW99	511							
Did you (or your husband/partner) decide to use (method) despite someone discouraging you from doing so?	NO0 YES.....1 DON'T KNOW99	512							
Before you (or your husband/partner) decided to use (method), did you talk to someone who had used <u>any</u> contraceptive method?	NO0 YES.....1 DON'T KNOW99	513							
Before you (or your husband/partner) decided to use (method), did you talk to someone who had used the <u>particular</u> contraceptive method you chose?	NO0 YES.....1 DON'T KNOW99	514							
Who was the <u>first</u> person in this area you knew for certain was using a <u>modern</u> contraceptive method? [Ask for both official name and nickname. If no one is known, write "NONE" under NAME.]	OFFICIAL NAME: _____ NICKNAME/POPULAR NAME: _____	524							
How did you know [name] was using a modern method? [CIRCLE ALL THAT APPLY]	HE/SHE TOLD ME1 SOMEONE ELSE TOLD ME2 I SUSPECT SO.....3 OTHER4 (SPECIFY)	525							

**Contraception: Knowledge,
Attitudes, and Practices**

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Secret Use									
Sometimes women use contraceptive methods without their husbands' being aware. We want to ask some questions about such "secret use". We are not interested in the people's names.									
Do you know of any instances (in this village) in which a woman was using a contraceptive method with her husband without her husband being aware?	NO0 YES.....1 DON'T KNOW99			518					
How do you know?	SHE TOLD ME 1 SOMEONE ELSE TOLD ME...2 I SUSPECT SO.....3			519					
Why was the woman using secretly? [CIRCLE ALL THAT APPLY.]	HUSBAND OPPOSES FP1 HUSBAND WANTS ANOTHER CHILD SOON2 WOMAN IS OVERBURDENED WITH CHILDREN3 WANTS TO SPACE BIRTHS.....4 OTHER5 SPECIFY DON'T KNOW99			520					
Did you approve of this woman's secret use of a contraceptive method, do you have no opinion, or do you disapprove or her secret use?	APPROVE.....1 NO OPINION2 DISAPPROVE.....3			521					
Since you learned that a woman can use a contraceptive method secretly, have you discussed this possibility with anyone else?	NO0 YES.....1 DON'T KNOW99			522					
Have you ever used a contraceptive method with your husband without him being aware?	NO0 YES.....1			523					
What method(s) have you used with your husband without him being aware?	PILL.....1 INJECTION2 FOAM/JELLY/DIAPHRAGM....3 IUD4 FEMALE STERILIZATION5 RHYTHM/PERIODIC ABSTINENCE6 HERBS7 NORPLANT®8 OTHER9 (SPECIFY)			524					

**Contraception: Knowledge,
Attitudes, and Practices**

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Are you currently using a contraceptive method without your husband/partner being aware?	NO0			525					
	YES.....1								
What method are you currently using without your husband/partner being aware?	PILL.....1			526					
	INJECTION2								
	FOAM/JELLY/DIAPHRAGM.....3								
	IUD4								
	FEMALE STERILIZATION5								
	RHYTHM/PERIODIC ABSTINENCE6								
	HERBS7								
	NORPLANT®8								
	OTHER9 (SPECIFY)								

Method—Specific Questions

METHOD DESCRIPTION		
PILL: Women can take a pill every day.	IUD: Women can have a loop or coil placed inside them by a doctor or a nurse.	WITHDRAWAL: Men can be careful to pull out before climax.
INJECTION: Women can have an injection by a doctor or nurse which stops them from becoming pregnant for several months.	FEMALE STERILIZATION: Women can have an operation to avoid having any more children.	HERBS: Women can use herbs to space births or avoid pregnancy.
DIAPHRAGM/FOAM / JELLY: Women can place a rubber disk, suppository, jelly, or cream inside them before intercourse.	MALE STERILIZATION: Men can have an operation to avoid having any more children.	NORPLANT: Women can have some small sticks inserted under the skin of their upper arms.
CONDOM: Men can use a rubber sheath during sexual intercourse.	RHYTHM/PERIODIC ABSTINENCE: Couples can avoid having sexual intercourse on certain days of the month when the women is more likely to become pregnant.	Have you heard of any other ways or methods that women or men can use to avoid pregnancy? _____ (SPECIFY)

People can use means or methods to space births or avoid pregnancy. Which methods of contraception have you ever heard of?

[Circle 1 for each method known spontaneously. Then read the name and description of each method not mentioned spontaneously. Circle 2 if the method is recognized and circle 0 if method is not recognized. Ask further questions for each of the methods with 1 or 2 circled] (Round 2)

R4 & R8: [Circle 1 for Q. 505 for each method known spontaneously. Then read the name and description of each method not mentioned spontaneously. Circle 2 for Q. 505 if the method is recognized and circle 0 if method is not recognized. Ask Q. 506-512 (horizontally) for each of the methods with 1 or 2 circled in Q.505. Don't ask Q506-512 for methods with 0 circled].

Method—Specific Questions

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Have you ever heard of <method>?	NO0 YES SPONT1 YES PROBED.....2	503	505		505				505a-505f
Have you and your husband/partner ever used <method> to space births or avoid pregnancy?	NO0 YES.....1	504							
Are you and your husband/partner currently using <method> to space births or avoid pregnancy?	NO0 YES.....1	505							
Do you approve or disapprove of couples using <method> to space births or delay pregnancy?	APPROVE.....1 DISAPPROVE.....2	515			506				506a-506f

Method—Specific Questions

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
<p>[If respondent is not currently in union, omit]</p> <p>R8: omit Q. 507</p> <p>Does your husband/partner approve or disapprove of couples using (method) to space births or delay pregnancy?</p>	APPROVE.....1 DISAPPROVE.....2 DON'T KNOW.....99	516			507				507a-507f
<p>How effective do you think (method) is in spacing births or avoiding pregnancy on a scale of 0 to 10, where 0 is not at all effective and 10 is completely effective?</p>	(0-10) DON'T KNOW.....99	517							
<p>Can you name any side effects of (method)?</p>	HAS NONE0 DIZZINESS1 WEIGHT GAIN.....2 WEIGHT LOSS.....3 HEADACHES.....4 EXCESSIVE BLEEDING.....5 IRREGULAR CYCLE6 PAINFUL PERIOD/CRAMPS...7 HEART BEAT8 PROMISCUITY9 MARITAL PROBLEMS10 AFFECTS FUTURE FERTILITY11 LOSS OF PLEASURE12 LOSS OF SEXUAL FUNCTION13 LOSS OF STRENGTH.....14 BAD FOR HEALTH.....15 OTHER16 (SPECIFY) DON'T KNOW.....99	518							
<p>From what source did you <u>first</u> learn about (method)?</p>	[RECORD ALL RESPONSES] FRIENDS1 PARENTS2 SIBLINGS3 OTHER RELATIVES.....4 WORKMATE5 ACQUAINTANCE6 SCHOOL.....7 CHURCH8 FAMILY PLANNING/HEALTH WORKER.....9 HOSPITAL/CLINIC10 PHARMACY/CHEMIST.....11 RADIO12 TELEVISION.....13 NEWSPAPER/MAGAZINE14 POSTER/ BILLBOARD15 ASSOCIATION/DURBARS16 OTHER17 (SPECIFY) DON'T KNOW.....99	519							

Method—Specific Questions

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	[RECORD ONE RESPONSE]								
Where could someone obtain (method)?	NO PLACE.....0 GOVERNMENT HOSPITAL/ HEALTH CENTER/ FAMILY PLANNING CLINIC 1 FIELD WORKER.....2 PHARMACY/CHEMIST.....3 PRIVATE HOSPITAL.....4 PRIVATE DOCTOR/CLINIC5 CHURCH6 FRIENDS/RELATIVES7 CBD'S8 TBA'S.....9 HERBALIST 10 OTHER _____ 11 (SPECIFY) DON'T KNOW99	520							
	[RECORD ALL RESPONSES]								
Have you talked to anyone (other than your partner/ husband) who encouraged you to use <method>?	NO0 YES.....1		506		508				508a-508f
Have you talked to anyone (other than your partner/ husband) who discouraged you from using <method>?	NO0 YES.....1		507		509				509a-509f
Do you know of any person using <method> to space births or avoid pregnancy? (R4: "We do not want names"). (R8: "We do not want to know any names")	NO0 YES.....1	506	508		510				510a-510f
Do you think<method> is expensive or not expensive?	EXPENSIVE.....1 INEXPENSIVE2 DON'T KNOW99		509		511				511a-511f
Have you heard about any of your friends or relatives or anyone in this community experiencing bad health effects from using <method>? We do not want to know any names.	NO0 YES.....1		510		512				512a-512f
If a woman uses <method> and then stops, will it be more difficult afterwards to have more children than if she had not used <method>?	NO0 YES.....1 DON'T KNOW99		511						511a a-511af

SOCIAL INTERACTION

Social Interaction

NAME GENERATORS

- Round 1:** We all talk to others about important matters in our lives. I would like to ask about the people other than your husband/partner whose opinions are important to you. They are people with whom you discuss your personal affairs or private concerns, such as children's illness, schooling, pregnancy, work, and church. They can live nearby or far away and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people whose opinions matter to you?
- Round 2:** During the last interview, we asked about the people with whom you discuss important matters in your life. Now, I would like to ask about the people other than your husband/partner with whom you discuss modern contraception. These are people with whom you have discussed the costs and benefits of modern contraceptive methods, where they can be obtained, their side effects, and how the methods are used. These people can live nearby or far away, and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people with whom you have discussed modern contraception in the last 12 months?
- Round 3:** During the last interview, we asked about the people with whom you discuss modern contraception. Now, I would like to ask about the people other than your husband/partner with whom you discuss (talk about) the illness called AIDS. These are people with whom you have discussed the ways by which the illness is spread and the means one can use to prevent becoming infected. These people can live nearby or far away, and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people with whom you have discussed AIDS in the last 12 months?
- Round 4:** During the last interview, we asked about the people with whom you discuss the illness called AIDS. This time I would like to ask about the people, other than your husband/partner, whose opinions are important to you. They are the people with whom you discuss your personal affairs or private concerns, such as children's illness, schooling, pregnancy, work, and church. These people can live nearby or far away, and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people whose opinions are important to you?
- Round 5:** During the last interview, we asked about the people with whom you discuss important matters in your life. Now, I would like to ask about the people other than your husband/partner with whom you discuss modern contraception. These are people with whom you have discussed the costs and benefits of modern contraceptive methods, where they can be obtained, their side effects, and how the methods are used. These people can live nearby or far away, and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people with whom you have discussed modern contraception in the last 12 months?
- Round 6:** I would like to ask about the people, other than your husband/partner, whose opinions are important to you. They are the people with whom you discuss your personal affairs or private concerns, such as children's illness, schooling, pregnancy, work, and church. These people can live nearby or far away, and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people whose opinions are important to you?
- Round 7:** During the last interview, we asked about the people whose opinions are important to you. Now, I would like to ask about the people other than your husband/partner with whom you discuss (talk about) the illness called AIDS. These are people with whom you have discussed the ways by which the illness is spread and the means one can use to prevent becoming infected. These people can live nearby or far away, and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people with whom you have discussed HIV/AIDS in the last 12 months?

Social Interaction

Round 8: During the last interview, we asked about the people with whom you discuss important matters in your life. Now, I would like to ask about the people other than your husband/partner with whom you discuss modern contraception. These are people with whom you have discussed the costs and benefits of modern contraceptive methods, where they can be obtained, their side effects, and how the methods are used. These people can live nearby or far away, and you might talk to them frequently or infrequently. Other than your husband/partner, can you please give me the names of people with whom you have discussed modern contraception in the last 12 months?

Social Interaction

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
<p>[Interviewer: Write all names mentioned on a sheet of paper. Count all the names on the sheet of paper and answer Q.600. Write the official names and nicknames of the first four people mentioned in the boxes at Q.601a-Q601d, and on the left side of the table below. If fewer than four people are named, probe "Can you think of anyone else?"]</p>	<p>TOTAL NUMBER OF PEOPLE NAMED:</p> <p>TOTAL: □□</p>	600	600	600	600	600	600	600	600
<p>Person 1 – Person 4</p> <hr style="border: 1px solid black;"/> <p>NICKNAME/POPULAR NAME:</p> <hr style="border: 1px solid black;"/>	<p>NAME:</p> <hr style="border: 1px solid black;"/> <p>NICKNAME/POPULAR NAME:</p> <hr style="border: 1px solid black;"/>	601a-601d	601-601d	601a-601d	601a-601d	601a-601d	601a-601d	601a-601d	601a-601d
<p>Is this person one of these you told us about in previous interviews?</p> <p>[If "Yes", compare network partner name with network partner names on background sheet. Enter the number of the network partner in the box.]</p>	<p>NO 0</p> <p>Previous Network Partner Number □□</p>						602a-602d	602a-602d	602a-602d
<p>You have named the people whose opinions are the most important to you. Now I would like to know how well these people know each other. Would you say that they are:</p>	<p>CONFIDANTS 1 JUST FRIENDS 2 ACQUAINTANCES 3 RELATIVES, CONFIDANTS 4 RELATIVES, NOT CONFIDANTS 5 DON'T KNOW EACH OTHER 6 DON'T KNOW 99</p>								
<p>Person 1 and Person 2</p>		602	602	603	603	603	603	603	603
<p>Person 1 and Person 3</p>		603	603	604	604	604	604	604	604
<p>Person 1 and Person 4</p>		604	604	605	605	605	605	605	605
<p>Person 2 and Person 3</p>		605	605	606	606	606	606	606	606
<p>Person 2 and Person 4</p>		606	606	607	607	607	607	607	607
<p>Person 3 and Person 4</p>		607	607	608	608	608	608	608	608
<p>Is this person the same as any of the people you told us you talked to about important matters or the people you talked to about modern contraception?</p>	<p>NO 0</p> <p>Previous Network Partner Number □</p>			602a-602d	602a-602d	602a-602d	602a-602d	602a-602d	602a-602d

Social Interaction

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
[If "Yes", compare network partner name with network partner names on background sheet. Enter the number of the network partner in the box.]									
Is [name] a male or a female?	MALE1 FEMALE.....2	608a-608d	608a-608d	609a-609d	609a-609d	609a-609d	609a-609d	609a-609d	609a-609d
What is your relationship to [name]?	FRIEND.....1 RELATIVE.....2 WORKMATE.....3 PASTOR/PRIEST.....4 OTHER.....5 (SPECIFY)	609a-609d							
What is your relationship to [name]?	FRIEND.....1 RELATIVE.....2 WORKMATE.....3 PASTOR/PRIEST.....4 FAMILY PLANNING/ HEALTH WORKER.....5 OTHER.....6 (SPECIFY)		609a-609d	610a-610d	610a-610d	610a-610d	610a-610d	610a-610d	610a-610d
Is [name] a confidant or not a confidant of yours?	CONFIDANT.....1 NOT A CONFIDANT.....2	610a-610d	610a-610d	611a-611d	611a-611d	611a-611d	611a-611d	611a-611d	611a-611d
Is [name] older than you, about the same age, or younger than you?	OLDER.....1 SAME AGE.....2 YOUNGER.....3 DON'T KNOW.....99	611a-611d	611a-611d	612a-612d	612a-612d	612a-612d	612a-612d	612a-612d	612a-612d
What is [name's] marital status?	NEVER MARRIED, NOT IN UNION.....1 IN CURRENT UNION.....2 CURRENTLY MARRIED.....3 SEPARATED.....4 DIVORCED.....5 WIDOWED.....6 DON'T KNOW.....99	612a-612d	612a-612d	616a-616d	616a-616d	616a-616d	616a-616d	616a-616d	616a-616d
How much schooling has [name] completed?	NONE.....1 PRIMARY.....2 JR SEC/MIDDLE.....3 SR SEC/OR HIGHER.....4 DON'T KNOW.....99	613a-613d	613a-613d	613a-613d	613a-613d	613a-613d	613a-613d	613a-613d	613a-613d
What is [name's] religion?	NONE.....0 CATHOLIC.....1 ORTHODOX PROTESTANT.....2 MOSLEM.....3 SYNCRETIC.....4 PENTACOSTAL/ CHARISMATIC.....5 TRADITIONAL.....6 OTHER.....7 (SPECIFY) DON'T KNOW.....99	614a-614d	614a-614d	614a-614d	614a-614d	614a-614d	614a-614d	614a-614d	614a-614d
What is [name's] ethnicity?	ADANGBE.....1 GA.....2 DENKYIRA.....3 FANTI.....4 AHANTA.....5 EWE.....6 OTHER.....7	615a-615d	615a-615d	615a-615d	615a-615d	615a-615d	615a-615d	615a-615d	615a-615d

Social Interaction

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	(SPECIFY) DON'T KNOW99								
Where does [name] live?	IN THIS COMPOUND 1 IN THIS COMMUNITY 2 RURAL AREA NEARBY 3 RURAL AREA FAR 4 URBAN AREA NEARBY 5 URBAN AREA FAR 6 OUTSIDE GHANA 7	616a- 616d	616a- 616d	617a- 617d	617a- 617d	617a- 617d	617a- 617d	617a- 617d	617a- 617d
Is [name] economically better off than you, just about the same as you, or worse off than you?	BETTER OFF THAN RESPONDENT 1 ABOUT THE SAME AS RESPONDENT 2 WORSE OFF THAN RESPONDENT 3 DON'T KNOW 99	617s- 617d	617a- 617d	618a- 618d	618a- 618d	618a- 618d	618a- 618d	618a- 618d	618a- 618d
How often do you talk to [name]?	ALMOST EVERY DAY 1 AT LEAST ONCE A WEEK 2 AT LEAST ONCE A MONTH ... 3 LESS THAN ONCE A MONTH 4 DON'T KNOW 99	618a- 618d	618a- 618d	619a- 619d	619a- 619d	619a- 619d	619a- 619d	619a- 619d	619a- 619d
Has [name] ever given you or your family help or provided other assistance when you have needed it? [REFER TO Q619a2 CATEGORIES IF CLARIFICATION REQUIRED]]	NO 0 YES 1 DON'T REMEMBER 99 → NO, 99: GO TO Q. 619a4								619a1 - 619d1
What kind of help or assistance has [name] given you or your family? [CIRCLE ALL THAT APPLY]	CASH/MONEY/PAID BILLS 1 GIFT (TV, RADIO, ETC) 2 HELPED FIND JOB, WORK 3 IMPORTANT ADVICE 4 CARED FOR CHILD 5 PROVIDED TRANSPORT 6 PROVIDED HOUSING 7 OTHER 8 (SPECIFY)								619a2 - 619d2
How often does [name] helped or provided assistance to you or your family?	ONCE 1 A FEW TIMES 2 MANY TIMES/OFTEN 3 (ALMOST) DAILY 4								619a3 619d3
Have you or your family ever given help or provided other assistance to [name] when they have needed it? [REFER TO Q619a5 CATEGORIES IF CLARIFICATION REQUIRED]]	NO 0 YES 1 DON'T REMEMBER 99 → NO, 99: GO TO Q. 620a								619a4 - 619d4
What kind of help or assistance have you or your family given to [name]? [CIRCLE ALL THAT APPLY]	CASH/MONEY/PAID BILLS 1 GIFT (TV, RADIO, ETC) 2 HELPED FIND JOB, WORK 3 IMPORTANT ADVICE 4 CARED FOR CHILD 5 PROVIDED TRANSPORT 6 PROVIDED HOUSING 7								619a5 - 619d5

Social Interaction

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	OTHER8 (SPECIFY)								
How often do you or your family help or provided assistance to [name]?	ONCE1 A FEW TIMES.....2 MANY TIMES/OFTEN 3 (ALMOST) DAILY4								619a6 - 619d6
Does [name] also discuss important matters with you?	NO0 YES.....1	619a- 619d			620a- 620d		620a- 620d		
Have you ever discussed matters of children's health?	NO0 YES.....1				622a- 622d		622a- 622d		
Have you and [name] ever discussed matters of child-bearing, such as how to avoid pregnancy, how to ensure proper birth spacing, or how to have the number of children that you want?	NO0 YES.....1 DON'T KNOW99	620a- 620d			623a- 623d		623a- 623d		
Do you think [name] approves of couples using a modern method of contraception to space births or avoid pregnancy?	NO0 YES.....1 DON'T KNOW99	621a- 621d	619a- 619d		624a- 624d	620a- 620d	624a- 624d		620a- 620d
Do you think [name] or [name's] spouse has ever used a modern contraceptive method to space births or avoid pregnancy?	NO0 YES.....1 DON'T KNOW99	622a- 622d	620a- 620d		625a- 625d	621a- 621d	625a- 625d		621a- 621d
How do you know? [CIRCLE ALL THAT APPLY]	HE/SHE TOLD ME1 SOMEONE ELSE TOLD ME.....2 I SUSPECT SO3 OTHER4 (SPECIFY) DON'T KNOW99	623a- 623d	621a- 621d		626a- 626d	622a- 622d	626a- 626d		622a- 622d
Have you and [name] ever discussed the illness HIV/AIDS?	NO0 YES.....1				627a- 627d		627a- 627d		
Which modern contraceptive method do you think [name or name's spouse] has ever used? [CIRCLE ALL THAT APPLY]	PILL1 INJECTION2 FOAM/JELLY/DIAPHRAGM3 CONDOM4 IUD5 FEMALE STERILIZATION6 MALE STERILIZATION7 NORPLANT8 OTHER9 DON'T KNOW99		622a- 622d			623a- 623d			623a- 623d
You said that you have talked about modern contraception with this person. Have you sought information about contraception from [name]?	NO0 YES.....1		623a- 623d			624a- 624d			624a- 624d
Has [name] ever encouraged you to use a modern contraceptive method?	NO0 YES.....1		624a- 624d			625a- 625d			625a- 625d
Has [name] ever discouraged you from using a modern contraceptive method?	NO0 YES.....1		625a- 625d			626a- 626d			626a- 626d
Have you ever encouraged [name] to use a modern contraceptive method?	NO0 YES.....1		626a- 626d			627a- 627d			627a- 627d

Social Interaction

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Have you ever discouraged [name] from using a modern contraceptive method?	NO0 YES.....1		627a-627d			628a-628d			628a-628d
Is [name's] opinion about modern contraception important to you?	NO0 YES.....1		628a-628d			629a-629d			629a-629d
Did you and [name] discuss the ways that HIV/AIDS is spread?	NO0 YES.....1 DON'T KNOW99			620a-620d				620a-620d	
Which ways of spreading HIV/AIDS did you discuss? [CIRCLE ALL WAYS MENTIONED]	UNPROTECTED SEX (sex without condom).....1 BLOOD TRANSFUSION.....2 MOTHER TO CHILD.....3 SHARING NEEDLES/RAZOR BLADES.....4 INSECT BITE5 EATING UTENSILS6 HUGGING/KISSING7 OTHER8 (SPECIFY)			621a-621d				621a-621d	
Did you and [name] discuss ways to prevent the spread of HIV/AIDS?	NO0 YES.....1			622a-622d				622a-622d	
Which ways of preventing the spread of HIV/AIDS did you discuss? [CIRCLE ALL WAYS MENTIONED]	USING A CONDOM.....1 LIMITING NUMBER OF SEXUAL PARTNERS2 ABSTAINING FROM SEX.....3 NOT SHARING NEEDLES/RAZOR BLADES4 OTHER9 (SPECIFY)			623a-623d				623a-623d	
Has [name] ever advised you that using a condom would lessen an individual's chance of contracting HIV/AIDS?	NO0 YES.....1			624a-624d					
Have you ever advised [name] that using a condom would lessen an individual's chance of contracting HIV/AIDS?	NO0 YES.....1			625a-625d					
Has [name] ever advised you that reducing an individual's number of sexual partners would lessen the chance of contracting HIV/AIDS?	NO0 YES.....1			626a-626d					
Have you ever advised [name] that reducing an individual's number of sexual partners would lessen the chance of contracting HIV/AIDS?	NO0 YES.....1			627a-627d					
Does [name] believe that the presence of sexually transmitted diseases, such as gonorrhea, syphilis enhances transmission of HIV/AIDS?	NO0 YES.....1 DON'T KNOW99			628a-628d					
Has [name] ever told you where or from whom to seek information and advice on HIV/AIDS?	NO0 YES.....1 DON'T KNOW99			629a-629d					

Social Interaction

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Where or from whom did [name] tell you to seek information and advice on HIV/AIDS? [CIRCLE ALL MENTIONED.]	CLINIC/HOSPITAL 1 DOCTOR/NURSE/ HEALTH WORKER.....2 PASTOR3 TEACHER.....4 OTHER5 (SPECIFY)			630a- 630d					
Have you and [name] ever discussed a message about HIV/AIDS that one or both of you heard on the radio/television?	NO0 YES.....1			631a - 631d				631a- 631d	
Is [name's] opinion about HIV/AIDS important to you?	NO0 YES.....1			632a- 632d				632a- 632d	
[If more than one network partner named] Of these people I have been talking to you about, which person's opinions are the most important to you ?	PERSON #11 PERSON #22 PERSON #3.....3 PERSON #44 DON'T KNOW99	624							
Of these people whose opinions are important to you, which person's opinions about <u>modern</u> contraception are the most important to you?	ALL EQUAL0 PERSON #51 PERSON #62 PERSON #73 PERSON #84		629						
Of these people whose opinions are important to you, which person's opinions about HIV/AIDS are the most important to you?	ALL EQUAL0 PERSON #91 PERSON #102 PERSON #113 PERSON #124			633					
Of these people whose opinions are important to you, which person's opinions are the most important to you?	ALL EQUAL0 PERSON #131 PERSON #142 PERSON #153 PERSON #164				628				
Of these people whose opinions are important to you, which person's opinions are the most important to you?	ALL EQUAL0 PERSON #171 PERSON #182 PERSON #193 PERSON #204					630			
Of these people whose opinions are important to you, which person's opinions are the most important to you?	ALL EQUAL0 PERSON #211 PERSON #222 PERSON #233 PERSON #244						628		
Of these people whose opinions are important to you, which person's opinions about HIV/AIDS are the most important to you?	ALL EQUAL0 PERSON #251 PERSON #262 PERSON #273 PERSON #284							633	

Social Interaction

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
Of these people whose opinions are important to you, which person's opinions are the most important to you?	ALL EQUAL0 PERSON #291 PERSON #302 PERSON #313 PERSON #324								630
If "ALL EQUAL", please explain why.	_____ _____ _____			635	630	632	630	635	632
Please explain why [most important person's] opinions are the most important to you.	_____ _____ _____				629	631	629	634	631
Why are [most important person's] opinions the most important to you? [CIRCLE ALL THAT APPLY]	SOCIAL POSITION1 RELATIVE2 FRIEND3 REPUTATION4 KNOWLEDGE5 LIFE EXPERIENCE6 OTHER7 (SPECIFY)	625				631			

Network Partner Matching

Network Partner Matching

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
FOR NETWORK PARTNERS 1 –									
NWP NAME					1000	1000	1000	1000	1000
Does [NWP] live in [NAME OF COMMUNITY]?	NO 0 YES 1				1001	1001	1001	1001	1001
Has [NWP] lived in [NAME OF COMMUNITY] in the last five years?	NO 0 YES 1				1002	1002	1002	1002	1002
[Go to Community Roster and locate the ID number for the network partner. If ID number cannot be located, write in “No ID”.]	_____				1003	1003	1003	1003	1003
	[NWP’s] ID Number								
Is [NWP] same as a [NWP] from a previous round?	[If No, enter “0”. Otherwise, enter NWP number from earliest previous round.]				1004	1004	1004	1004	1004
<p>Check the background information sheet for the Round 4 and Round 5 inconsistent Network Partner matches. For each person, copy the Network Partner Number into column 1, Network Partner’s Official Name into column 2, Network Partner’s Popular Name into column 3, Round 4 Network Partner Matching ID into column 4 and Round 5 Network Partner Matching ID into column 5] For each Network Partner, attempt to resolve the inconsistency. In column 6, write and circle the appropriate code.. If 3 is circled implying that the Network Partner has a different ID apart from those for Round 4 and Round 5, enter the correct Network Partner matching ID in column 7</p>									
Network Partner Number	_____						1101a-1101g		
Name (Official)	_____						1102b-1102g		
Name (Popular)	_____						1103a-1103g		
Round 4 Network Partner Matching ID							1104a-1104g		
Round 5 Network Partner Matching ID							1105a-1105g		
Decision	Round 4 Correct 1 →GO TO NEXT NWP Round 5 Correct 2 →GO TO NEXT NWP Different ID 3 →GO TO COLUMN 7 Mistaken Identity (Name not in sample) 4 →GO TO NEXT NWP						1106a-1106g		
NWP’s ID Number							1107a-1107g		

AIDS

AIDS

QUESTION	CATEGORIES	R O U N D S							
		1	2	3	4	5	6	7	8
Have you ever heard of AIDS?	NO 0 YES 1	800	800						
In the last month, from which mass media sources (radio, television, newspaper, magazines) did you receive information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 RADIO 1 TELEVISION 2 NEWSPAPER 3 MAGAZINES 4	801a							
Since the last interview, from which mass media sources (radio, television, newspaper, magazines) have you received information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 RADIO 1 TELEVISION 2 NEWSPAPER 3 MAGAZINES 4		801			801		801	
Since the last interview, in which meeting places (church/mosque, school, community meeting/durbar market place) have you received information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 CHURCH/MOSQUE 1 SCHOOL 2 COMMUNITY MEETING/ DURBAR 3 MARKET PLACE 4 OTHER 5 (SPECIFY)		802			802		802	
In the last month, in which meeting places (church/mosque, school, or community meeting/durbar) have you received information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 CHURCH/MOSQUE 1 SCHOOL 2 COMMUNITY MEETING/ DURBAR 3 OTHER 4 (SPECIFY)	801b							
In the last month, from which types of people (friends, relatives, workmates) have you received information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 FRIENDS 1 RELATIVES 2 WORKMATES 3 OTHER 4 (SPECIFY)	801c							
Since the last interview, from which types of people (friends, relatives, workmates) have you received information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 FRIENDS 1 RELATIVES 2 WORKMATES 3 OTHER 4 (SPECIFY)		803			803		803	
In the last month, from what other sources have you received information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 POSTERS 1 PAMPHLETS 2 OTHER 3 (SPECIFY)	801d							

AIDS

QUESTION	CATEGORIES	R O U N D S							
		1	2	3	4	5	6	7	8
Since the last interview, from what other sources have you received information about AIDS? [CIRCLE ALL THAT APPLY]	NONE 0 POSTERS 1 PAMPHLETS 2 OTHER 3 (SPECIFY)		804			804		804	
Have you received information about AIDS in the last month from a Health Worker?	NO 0 YES 1	801e							
Since the last interview, have you received information about AIDS from a Health Worker?	NO 0 YES 1		805			805		805	
Have you been involved in any conversations about HIV/AIDS with someone other than a health worker since the last interview?	NO 0 YES 1		806			806			
How often have you had these conversations about HIV/AIDS since the last interview?	ALMOST EVERY DAY 1 AT LEAST ONCE A WEEK 2 AT LEAST ONCE A MONTH... 3 LESS THAN ONCE A MONTH 4 DON'T KNOW 99		807			807			
Are these conversations mostly with men, with women, or with mixed groups?	MOSTLY MEN 1 MOSTLY WOMEN 2 MIXED GROUPS 3		808			808			
Are these conversations mostly with people older than you, your age mates, people younger than you, or is there a mixture of people of all ages?	MOSTLY OLDER 1 AGE MATES 2 MOSTLY YOUNGER 3 MIXED AGES 4		809			809			
Where did most of these conversations take place?	IN THIS COMPOUND 1 IN THIS VILLAGE 2 OUTSIDE THIS VILLAGE 3		810			810			
What did you discuss?	_____ _____ _____		811						
We are not interested in the person's name. Do you know of anybody in this community who has/had AIDS?	NO 0 YES 1		812			811		811	
How do you know? [CIRCLE ALL THAT APPLY]	HE/SHE TOLD ME 1 SOMEONE ELSE TOLD ME ... 2 I SAW THE SICK PERSON 3 I SUSPECT SO 4 OTHER 5 (SPECIFY) DON'T KNOW 99		813						
[If respondent has no husband/partner, omit] Since the last interview, have you discussed HIV/AIDS with your husband/partner?	NO 0 YES 1			636		812		812	
Did you and your husband/partner discuss the ways that HIV/AIDS is spread?	NO 0 YES 1			637		813		813	
Which ways of spreading HIV/AIDS did you discuss?	UNPROTECTED SEX (sex without condom) 1			638		814		814	

AIDS

QUESTION	CATEGORIES	R O U N D S							
		1	2	3	4	5	6	7	8
[CIRCLE ALL WAYS MENTIONED.]	BLOOD TRANSFUSION 2 MOTHER TO CHILD 3 SHARING NEEDLES/RAZOR BLADES 4 INSECT BITE 5 EATING UTENSILS 6 HUGGING/KISSING 7 OTHER 8 (SPECIFY)								
Did you and your husband/partner discuss ways to prevent the spread of HIV/AIDS?	NO 0 YES 1			639		815		815	
Which ways of preventing the spread of HIV/AIDS did you discuss? [CIRCLE ALL WAYS MENTIONED.]	ABSTAINING FROM SEX 1 USING A CONDOM 2 LIMITING NUMBER OF SEXUAL PARTNERS 3 NOT SHARING NEEDLES/RAZOR BLADES 4 OTHER 9 (SPECIFY)			640		816		816	
Is there no chance at all of you getting HIV/AIDS, or do you think there is a small chance, a moderate chance, or a big chance that you could get HIV/AIDS?	NO CHANCE AT ALL 1 SMALL CHANCE 2 MODERATE CHANCE 3 BIG CHANCE 4 DON'T KNOW 99			641		817		817	
[If respondent has no husband/partner, omit] Is there no chance at all of your husband/partner getting HIV/AIDS, or do you think there is a small chance, a moderate chance, or a big chance that your husband/partner could get HIV/AIDS?	NO CHANCE AT ALL 1 SMALL CHANCE 2 MODERATE CHANCE 3 BIG CHANCE 4 DON'T KNOW 99			642		818		818	
Now I would like to talk about all the possible ways in which AIDS can be transmitted. In what ways can AIDS be transmitted? [Interviewer: Circle code 1 for each response mentioned spontaneously. Then read down the column, naming the possible ways AIDS can be transmitted which have not been mentioned spontaneously by the respondent. Circle code 2 if the respondent recognizes the choice as a way of transmitting AIDS when probed and code 0 if the respondent does not recognize the choice as a way of transmitting AIDS. Code 99 if respondent does not know whether or not the choice can cause AIDS.]									
Sharing needles, razor blades, etc.	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	802							
Mother to child during pregnancy and childbirth	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	803							

AIDS

QUESTION	CATEGORIES	R O U N D S							
		1	2	3	4	5	6	7	8
Mother to child from breastfeeding	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	804							
Sexual intercourse	NO 0 YES/SPONTANEOUSLY (CONDOM MENTIONED) .. 1 YES/SPONTANEOUSLY (CONDOM NOT MENTIONED) 2 YES/PROBED 3 DON'T KNOW 99	805							
Transfusion of infected blood	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	806							
Shaking hands with or hugging someone who has AIDS	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	807							
Kissing someone who has AIDS	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	808							
Wearing clothes of someone who has AIDS	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	809							
Wearing "OBURONI WAWU" (imported second-hand clothing)	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	810							
Sharing eating utensils with someone who has AIDS	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	811							
Insect bite (e.g., mosquito, flea, bedbug)	NO 0 YES/SPONTANEOUSLY 1 YES/PROBED 2 DON'T KNOW 99	812							
Other _____ (SPECIFY)	NO 0 YES/SPONTANEOUSLY 1	813							
Is AIDS a common topic of conversation when you talk with other people?	NO 0 YES 1 DON'T KNOW 99	814							
Do you know of anybody in this community who has/had AIDS?	NO 0 YES 1	815							
How do you know? [CIRCLE ALL THAT APPLY]	HE/SHE TOLD ME 1 SOMEONE ELSE TOLD ME ... 2 I SAW THE SICK PERSON 3 I SUSPECT SO 4 OTHER _____ ... 5 (SPECIFY) DON'T KNOW 99	816							
Is it possible for a healthy looking person to have the AIDS germ in his/her body?	NO 0 YES 1 DON'T KNOW 99	817							

AIDS

QUESTION	CATEGORIES	R O U N D S							
		1	2	3	4	5	6	7	8
Have you heard of any other illnesses apart from AIDS that can be transmitted through sexual intercourse?	NO 0 YES 1	900							
Other Sexually Transmitted Diseases:									
GONORRHEA (discharge) HERPES (vesicles on genitals)									
SYPHILIS (sore on genitals) OTHER _____ (SPECIFY) For each disease									
Name and describe these illnesses.	NO 0 YES 1	901a- 901d							
Where can one go to treat <illness>? [CIRCLE ALL THAT APPLY]	NO PLACE..... 0 GOVT HOSPITAL/ CLINIC/HEALTH CENTRE/HEALTH POST 1 MOBILE CLINIC 2 COMMUNITY HEALTHWORKER 3 PRIVATE HOSPITAL/ DOCTOR/CLINIC 4 PHARMACY/ DRUGIST/CHEMIST..... 5 PRIVATE MIDWIFE 6 TRADITIONAL PRACTITIONER/ HERBALIST 7 SPIRITUALIST 8 OTHER 9 (SPECIFY) DON'T KNOW 99	902a- 902d							

COMMUNITY ASSOCIATIONS

Round 3: Now I would like to ask you about the community associations of which you are a member. These may be agricultural groups, credit associations, income generating groups, religious groups, or any other group to which people in this area belong. Please tell me the names of the community groups to which you belong (i.e., to which you pay membership dues and/or whose meetings you attend regularly, etc.).

Round 4: Last time, I asked you about the community associations of which you are a member. These were agricultural groups, credit associations, income generating groups, religious groups, or any other group to which people in this area belong. You told me you were a member of/you told me you didn't belong to any such groups. Please tell me the names of any groups which you have joined (i.e., to which you pay membership dues and/or whose meetings you attend regularly, etc.) since the last interview.

Community Associations

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
NAME OF GROUP	GROUP #1 – GROUP #4 (SPECIFY)			900	900				
Are you still a member of [association]?	NO 0 YES 1				901a-901d				
[Check community organization ID number from list for respondent's village.]	ID NUMBER □□			901	902a-902d				
[Sum all of the "YES" responses] TOTAL NUMBER OF GROUPS TO WHICH RESPONDENT CURRENTLY BELONGS:	TOTAL □□				903				
Do you hold any leadership position in [association]?	NO 0 YES 1				904a-904d				
What position?	_____				905a-905d				
Do you consider yourself to be relatively inactive or active in [association]?	INACTIVE 1 ACTIVE 2				906a-906d				
TOTAL NUMBER OF GROUPS NAMED:	TOTAL □□			902					
Do the members of (group) ever discuss matters of child bearing, such as how to avoid pregnancy, how to ensure proper birth spacing, how to have the number of children you want, or matters related to contraceptive use?	NO 0 YES 1 DON'T KNOW 99			903					
When was the most recent meeting at which matters of child bearing were discussed	IN THE LAST WEEK 1 IN THE LAST MONTH 2 IN THE LAST SIX MONTHS 3 IN THE LAST YEAR 4 MORE THAN A YEAR AGO 5 DON'T KNOW 99			904					
Do the members of (group) ever discuss matters of children's health, such as immunizations, when to seek medical care and where to go for treatment of a sick child?	NO 0 YES 1 DON'T KNOW 99			905					
When was the most recent meeting at which matters of children's health were discussed?	IN THE LAST WEEK 1 IN THE LAST MONTH 2 IN THE LAST SIX MONTHS 3 IN THE LAST YEAR 4 MORE THAN A YEAR AGO 5 DON'T KNOW 99			906					
Do the members of (group) ever discuss matters of children's schooling, such as the cost of sending children to school and the connection between education and	NO 0 YES 1 DON'T KNOW 99			907					

Community Associations

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
employment?									
When was the most recent meeting at which matters of children's schooling were discussed?	IN THE LAST WEEK 1 IN THE LAST MONTH 2 IN THE LAST SIX MONTHS 3 IN THE LAST YEAR 4 MORE THAN A YEAR AGO 5 DON'T KNOW 99			908					
Does (group) encourage members to use a modern contraceptive method?	NO 0 YES 1 DON'T KNOW 99			909					
Does (group) discourage members from using a modern contraceptive method?	NO 0 YES 1 DON'T KNOW 99			910					
How often do you attend religious meetings?	NEVER 1 RARELY 2 LESS THAN ONCE A MONTH 3 AT LEAST ONCE A MONTH 4 ABOUT ONCE A WEEK 5 MORE THAN ONCE A WEEK 6			911					
Since the last interview, how often have you attended meetings of [association]?	NOT AT ALL 1 ONCE/FEW TIMES 2 ABOUT ONCE A MONTH 3 SEVERAL TIMES PER MONTH 4 ABOUT ONCE A WEEK 5 MORE THAN ONCE A WEEK 6				907				
What is the name of the church/mosque/shrine you attend most frequently?				912					
What is the name of any other church/mosque/shrine you attend? [Write "NONE" if no other church/mosque/shrine is mentioned.]				913					
What is the name of any other church/mosque/shrine you attend? [Write "NONE" if no other church/mosque/shrine is mentioned.]				914					
Suppose something unfortunate happened to you, such as a sudden death in your family. Could you turn to [association] for help?	NO 0 YES 1				908				
Suppose something unfortunate happened to you, such as an economic loss (e.g., crop failure or loss of job). Could you turn to [association] for financial assistance?	NO 0 YES 1				909				
Do you pay attention to the opinions of others in [association] more than you pay	NO 0 YES 1				910				

Community Associations

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
attention to the opinions of others living in this community who are not members of [association]?									
Do you trust members of [association] more than you trust others living in this community who are not members of [association]?	NO 0 YES 1				911				
Of these associations, which one is the most important to you?	ASSOCIATION 1 1 ASSOCIATION 2 2 ASSOCIATION 3 3 ASSOCIATION 4 4 ALL EQUAL 5				912				
Of these associations, which one is the least important to you?	ASSOCIATION 1 1 ASSOCIATION 2 2 ASSOCIATION 3 3 ASSOCIATION 4 4 ALL EQUAL 5				913				
<p>We are interested to learn about the community organizations or associations that you have participated in. Such associations may be religious, social, political, economic, and so forth. We have a list of the associations that exist in this community, and we want to find out which ones you have participated in. I have just a few questions about each one.</p> <p>[Ask the respondent about each of the seven types of organizations. For each one, describe the type of organization, and read the list of such organizations in the community. For each one that the respondent has attended a meeting or participated in activities at any time in the past, record the ID in Q. 700 and the name in Q. 701, and ask Q. 702-706.]</p>									
ID of association							700		700
Name of association							701		701
Have you attended meetings, or participated in activities of [name of association] in the past 5 years?	No 0 →GO TO 706 Yes 1						702		702
Have you attended or participated regularly in the past 5 years?	No 0 Yes 1						703		703
Have you attended meetings, or participated in activities of [name of association] in the past year?	No 0 →GO TO 706 Yes 1						704		704
Have you attended or participated regularly in the past year?	No 0 Yes 1						705		705
Are you currently a member of [name of association]?	No 0 Yes 1						706		706

Community Associations

QUESTION	CATEGORIES	ROUND							
		1	2	3	4	5	6	7	8
Now I would like to ask you some more questions about (some of) the organizations and associations you named. [Interviewer: if respondent indicated participation or membership in <u>four or less</u>, write their names and ID in Q. 707 and Q. 708, and proceed to Q. 709. If more than four are mentioned, choose those four in which the respondent is most active or considers herself a member]									
NAME OF ASSOCIATION	ASSOCIATION 1 – ASSOCIATION 4						707a- 707d		707a- 707d
	ID.						708a- 708d		708a- 708d
In the past year, how often have you attended meetings or participated in activities of [name of association]	NOT AT ALL 1 ONCE/FEW TIMES 2 ABOUT ONCE A MONTH 3 SEVERAL TIMES PER MONTH 4 ABOUT ONCE A WEEK 5 MORE THAN ONCE A WEEK 6						709a- 709d		709a- 709d
Do you hold a leadership position in [name of association] ?	NO 0 YES 1						710a- 710d		710a- 710d
Does [name of association] provide social support for the members, such as providing monetary or instrumental assistance, offering advice, information, funeral support, etc.?	NO 0 YES 1 DON'T KNOW 99						711a- 711d		711a- 711d
Does [name of association] put pressure on its members in order to change or restrict members' attitudes to social issues?	NO 0 YES 1 DON'T KNOW 99						712a- 712d		712a- 712d
Does [name of association] discuss matters of child bearing, such as how to avoid pregnancy, how to ensure proper birth spacing, how to have the number of children you want?	NO 0 YES 1 DON'T KNOW 99						713a- 713d		713a- 713d
Does [name of association] encourage small families for its members?	NO 0 YES 1 DON'T KNOW 99						714a- 714d		714a- 714d
Does [name of association] discuss matters of child health, such as immunization, when to seek medical care and where to go for treatment of a sick child?	NO 0 YES 1 DON'T KNOW 99						715a- 715d		715a- 715d
Does [name of association] discuss matters of children's schooling, such as the cost of sending children to school and the connection between education and employment?	NO 0 YES 1 DON'T KNOW 99						716a- 716d		716a- 716d
Does [name of association] discuss issues related to HIV/AIDS, such as how the disease is spread and how it can be prevented?	NO 0 YES 1 DON'T KNOW 99						717a- 717d		717a- 717d

Community Associations

QUESTION	CATEGORIES	ROUND							
		1	2	3	4	5	6	7	8
Does [name of association] discuss issues related to modern contraception, such as the types of methods, where to obtain methods, the effectiveness and side effects of the methods?	NO 0 YES 1 DON'T KNOW..... 99						718a-718d		718a-718d
Does [name of association] encourage use of modern contraception by its members?	NO 0 YES 1 DON'T KNOW..... 99						719a-719d		719a-719d
Does [name of association] discourage use of modern contraception by its members?	NO 0 YES 1 DON'T KNOW..... 99 [GO TO Q. 709b. OR TO Q. 721]						720a-720d		720a-720d
Considering the associations that we have talked about, how would you rank them in order of importance in relation to how they are able to influence your behavior? [APPLY RANKINGS OF 1,2,3 &4]	721a. 721b. 721c. 721d.						721a-721d		721a-721d

HEALTH AND FAMILY PLANNING SERVICES

Health and FP Services

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
HEALTH SERVICES									
Service a. Divine Healing (Pastor/Mallam); b. Drugstore c. Herbalist/Traditional Healer d. Visiting Nurse e. Health Post f. Community Clinic g. Sub-District Health Centre h. District Hospital i. Regional Hospital									
Where is the nearest [Service]?	In Community1 Next Village/Town2 Other village/Town3 Don't Know99							1201a1 -1201i1	
Have you ever visited any [Service]?	No0 Yes1							1201a2 -1201i2	
When was your most recent visit to this [Service]?	Last Week1 Last month2 Last 3 Months3 Last 12 Months4 More than 12 Months5							1201a3 -1201i3	
I want to ask you about recent health problems of your younger children. This includes children who may have died recently. [Read names of children born January 1997 or later] HEALTH CONDITIONS a. Malaria/Fever b. Diarrhoea c. Persistent Cough									
During the past year, did any of these children suffer from [Health Condition]?	NO0 YES1							1202a1 -1202c1	
[if more than one child under age 5] Which of your children suffered from [Health Condition] most recently?	name _____ child number _____							1202a2 -1202c2	
1. From whom/where did you or someone else seek help first for the child's condition? 2. From whom/where did you or someone else seek help finally for the child's condition?	None0 Divine Healer1 Herbalist2 Drugstore3 Health post4 Community clinic5 Visiting Nurse6 Sub-district health center7 District Hospital8 Regional9 Other (Specify)10 1 _____ 2 _____							1202a3 -1202c3	
Was payment required for these services?	NO0 YES1 DON'T REMEMBER99							1202a4 -1202c4	

Health and FP Services

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	1 _____ 2 _____								
Was the payment monetary or non-monetary?	MONETARY.....1 NON-MONETARY2 BOTH3 DON'T REMEMBER99 1 _____ 2 _____							1202a5 - 1202c5	
Could the payment be deferred?	NO0 YES.....1 DON'T REMEMBER99 1 _____ 2 _____							1202a6 - 1202c6	
<p>Now I would like to ask about health problems suffered by someone in your household <u>other than children under age 5 (born since January 1997)</u>.</p> <p>HEALTH CONDITION</p> <p>a. Malaria/Fever b. Pregnancy Complication or Childbirth Complication</p>									
During the past year, did anyone in your household suffer from [Health Condition]?	NO0 YES.....1							1203a1 - 1203b1	
Thinking of the <u>most recent</u> such case, was this a male or female?	MALE1 FEMALE.2							1203a2 - 1203b2	
1. From whom/where did you or someone else seek help first for this person's condition? 2. From whom/where did you or someone else seek help finally for this person's condition?	None0 Divine Healer1 Herbalist.....2 Drugstore3 Health post.....4 Community clinic.....5 Visiting Nurse.....6 Sub-district health center7 District Hospital8 Regional9 Other (Specify) 10							1203a3 - 1203b3	
Was payment required for these services?	NO0 YES.....1 DON'T REMEMBER99							1203a4 - 1203b4	
Was the payment monetary or non-monetary?	MONETARY.....1 NON-MONETARY.2 BOTH3 DON'T REMEMBER99							1203a5 - 1203b5	
Could the payment be deferred?	NO0 YES.....1 DON'T REMEMBER99							1203a6 - 1203b6	

Services Module

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
FAMILY PLANNING SERVICES									
Method									
a. Condom									
b. Pill									
c. Injectable									
Do you know where to obtain [method]?	NO..... 0 YES 1								1204a1 - 1204c1
From what type of source do you think you can obtain [method]?	None..... 0 Divine Healer..... 1 Herbalist 2 Drugstore 3 Health post 4 Community clinic 5 Visiting Nurse 6 Sub-district health center..... 7 District Hospital 8 Regional 9 Other (Specify) 10 Don't Know 99								1204a2 - 1204c2
[Multiple choice]									
Have you ever obtained this family planning method?	NO 0 YES 1								1204a3 - 1204c3
When did you most recently obtain [method]?	LAST WEEK..... 1 LAST MONTH 2 LAST 3 MONTHS 3 LAST 12 MONTHS..... 4 MORE THAN 12 MONTHS 5								1204a4 - 1204c4
Where did you obtain [method] most recently?	IN COMMUNITY..... 1 NEXT VILLAGE 2 OTHER VILLAGE/TOWN..... 3								1204a5 - 1204c5
Was payment required for these services?	NO 0 YES 1								1204a6 - 1204c6
Could the payment be deferred?	NO..... 0 YES 1 DON'T KNOW 99								1204a7 - 1204c7
During the past year, has a health provider come to YOUR HOUSE to talk with you about matters such as proper birth spacing of children, immunizing your children against diseases, or how to maintain the health of your children??	NO 0 YES 1 DON'T KNOW 99								1205
When was the most recent such visit?	LAST WEEK..... 1 LAST MONTH 2 LAST THREE MONTHS..... 3 LAST 12 MONTHS..... 4								1206
What type of health provider was this?	DEVINE HEALER..... 1 HERBALIST 2 TRADITIONAL BIRTH ATTENDANT 3 COMMUNITY BASED								1207
[CIRCLE ALL THAT APPLY]									

Services Module

QUESTION	CATEGORIES	R O U N D							
		1	2	3	4	5	6	7	8
	DISTRIBUTOR..... 4 DRUGSTORE KEEPER 5 NURSE..... 6 COMMUNITY VOLUNTEER ... 7 PHARMACIST..... 8 DOCTOR..... 9 OTHER (SPECIFY) 10 _____								
During the most recent visit, what did you talk about? [CIRCLE ALL THAT APPLY]	CHILD HEALTH /SICKNESS.. 1 CONTRACEPTIVE USE 2 PROPER BIRTH SPACING OF CHILDREN..... 3 IMMUNIZATION OF CHILDREN..... 4 HIV/AIDS..... 5 OTHER (SPECIFY) 6 _____							1208	
During this visit, did the health provider give you any medical supplies or provide any medical services?	NO..... 0 YES..... 1							1209	
What type of health service would you prefer – One that can be brought to your home or one that you have to visit yourself?	HOUSE-HOUSE VISIT..... 1 FIXED HEALTH CENTER 2 DON'T KNOW..... 99							1210	
What type of health service management would you prefer- One managed by the Ministry of Health or One managed by the community?	MOH MANAGEMENT 1 COMMUNITY MANAGEMENT 2 MOH & COMMUNITY MANAGEMENT 3 INDIVIDUAL PRIVATE MANAGEMENT..... 4 OTHER.....5 (SPECIFY) DON'T KNOW..... 99							1211	
What type of Health Service ownership would you prefer – Ministry of Health ownership or community ownership?	MOH OWNERSHIP..... 1 COMMUNITY OWNERSHIP ... 2 MOH & COMMUNITY OWNERSHIP 3 INDIVIDUAL PRIVATE OWNERSHIP 4 OTHER..... 5 (SPECIFY) DON'T KNOW..... 99							1212	

CALENDAR DATA

Recorded For Every Month, Previous Interview Month Through Current Interview Month

Marital Status Calendar

		R1	R2	R3	R4	R5	R6	R7	R8
Marital Status Codes	NOT IN UNION..... 1		204a	211a	211a	211a	211a	211a	211a
	IN UNION..... 2								
	MARRIED..... 3								
	SEPARATED..... 4								
	DIVORCED..... 5								
	WIDOWED..... 6								
Husband away	NO..... 0		204b	211b	211b	211b	211b	211b	211b
	YES..... 1								

Pregnancy and Post-Partum Calendar

		R1	R2	R3	R4	R5	R6	R7	R8
Pregnancy Status	Not Pregnant..... N		351a	370a	317a	317a	317a	317a	317a
	Pregnant..... P								
	Miscarriage..... M								
	Induced Abortion..... I								
	Still Birth..... S								
	Live Birth..... L								
Breastfeeding Status	Not Breastfeeding..... N		351b	370b	317b	317b	317b	317b	317b
	Breastfeeding..... B								
Abstinence Status	Abstaining..... A		351c	370c	317c	317c	317c	317c	317c
	Not Abstaining..... N								

Contraception Calendar

		R1	R2	R3	R4	R5	R6	R7	R8
Methods 1-4	NOT USING..... 0		517a	510a	518a	518a	518a	518a	518a
	PILL..... 1		517b	510b	518b	518b	518b	518b	518b
	INJECTION..... 2		517c	510c	518c	518c	518c	518c	518c
	FOAM/JELLY/ DIAPHRAGM..... 3		517d	510d	518d	518d	518d	518d	518d
	CONDOM..... 4								
	IUD..... 5								
	FEMALE STERILIZATION..... 6								
	MALE STERILIZATION..... 7								
	RHYTHM/PERIODIC ABSTINENCE..... 8								
	WITHDRAWAL..... 9								
	HERBS..... 10								
	NORPLANT..... 11								

		R1	R2	R3	R4	R5	R6	R7	R8
Side Effects	NONE 0 DIZZINESS 1 WEIGHT GAIN 2 WEIGHT LOSS 3 HEADACHES 4 EXCESSIVE BLEEDING ... 5 IRREGULAR CYCLE 6 PAINFUL PERIOD 7 STOMACH PAINS/ CRAMPS 8 IRREGULAR HEART BEAT 9 MARITAL PROBLEMS 10 LOSS OF PLEASURE 11 LOSS OF SEXUAL FUNCTION 12 LOSS OF STRENGTH OR ILL HEALTH 13 OTHER 14 (SPECIFY)		517e	510e	518e	518e	518e	518e	518e
Advice	NO ADVICE RECEIVED 0 ENCOURAGED USE/CONTINUE USE 1 DISCOURAGED USE/DISCONTINUE USE 2 SWITCH METHODS 3 SIDE EFFECTS 4 OTHER 5 (SPECIFY)		535a	516a	525a	525a	525a	525a	525a

EMPLOYMENT CODE SHEET

- 1 = FARMING
- 2 = FISHING/HUNTING
- 3 = TRADING / SELLING
- 4 = TEACHING
- 5 = DRESS MAKING
- 6 = HAIR DRESSING
- 7 = CRAFTSMANSHIP (e.g., basketry, goldsmith, etc.)
- 8 = DRIVING (TRANSPORT BUSINESS)
- 9 = CONSTRUCTION BUSINESS (e.g., Carpentry, Masonry, etc.)
- 10 = APPRENTICE
- 11 = OTHER _____
(SPECIFY)
- 99 = DON'T KNOW

SCHOOLING CODE SHEET

PRE-1987 REFORM						POST-1987 REFORM						
No Schooling	NS					No Schooling	NS					
Primary	P1	P2	P3			Primary	P1	P2	P3			
	P4	P5	P6				P4	P5	P6			
Middle School	M1	M2	M3	M4		Junior Secondary	JS1	JS2	JS3			
Secondary, Ordinary Level	S1	S2	S3			Commercial, Vocational, Technical Institute	VT1	VT2	VT3	VT4		
	S4	S5				Senior Secondary	SS1	SS2	SS3			
Teacher Training College	T1	T2	T3	T4		Post-Secondary Teacher Training College	PS1	PS2	PS3			
Commercial, Vocational Technical Institute	VT1	VT2	VT3	VT4		Polytechnic Institute	PT1	PT2	PT3			
Secondary, Advanced Level	A1	A2				University	U1	U2	U3	U4	U5	U6
Post-Secondary Teacher Training College	PS1	PS2	PS3			DON'T KNOW	99					
Polytechnic Institute	PT1	PT2	PT3									
Specialist Teacher Training College	ST1	ST2	ST3									
University	U1	U2	U3	U4	U5	U6						
DON'T KNOW	99											

Supplementary Measurement Tables

C.1 Supplementary Measurement Tables and Figures

In figure C.1, we see the trends in infertility across the last three waves of data (waves 6, 7, and 8). The graph is limited to the final three waves of data because data on self-identification were not collected for waves 2 through 5. This graph includes not only the standard versions of the 4 objective measures of infertility, but also the standard measure of self-identified infertility, as well as the measure of uncertainty (i.e. women who responded "don't know" to the self-identification question). Figure C.1 shows that self-identified infertility and uncertainty about infertility status fall between the biomedical and demographic measures of infertility. Thus, women's own assessments of their infertility status are not perfectly aligned with either set of measures. Uncertainty shows the greatest fluctuation across waves.

A similar pattern can be observed in Figure C.1, which shows the proportion infertile over the last 3 waves of data for western measures. Interestingly, there is a slight decline in the proportion self-identifying as infertile between waves 7 and 8 (although the absolute proportion infertile is higher for the western measure than the standard measure), suggesting that some women who self-identify are still using contraceptives; were it the case that women who identify as infertile do not use contraceptives, controlling for western versus all methods of birth control

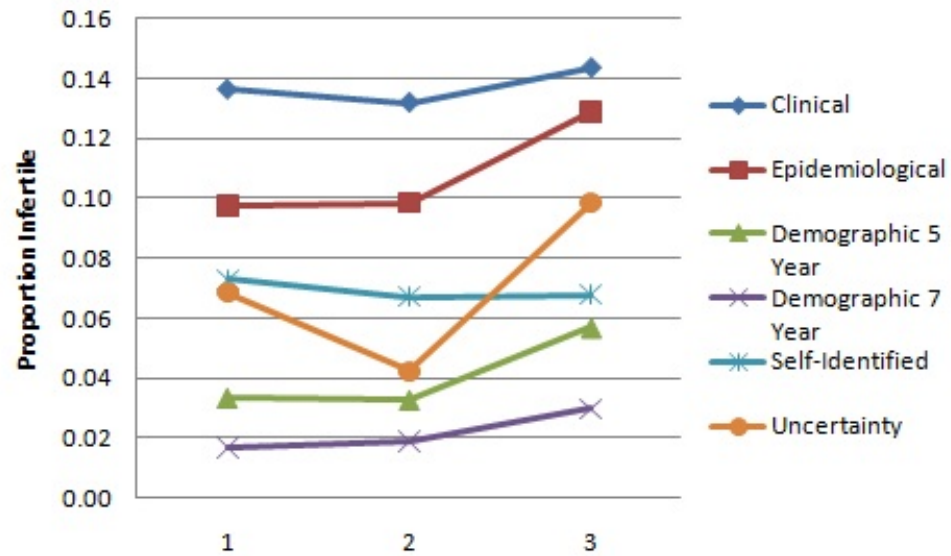


Figure C.1. Infertility Across Waves 6-8 Accounting for Birth Control

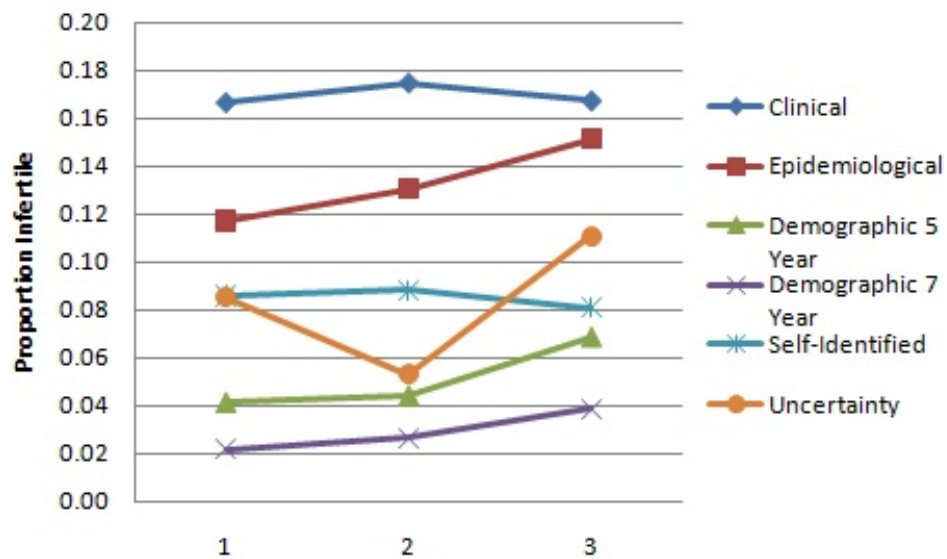


Figure C.2. Infertility Across Waves 6-8 Accounting for Western Birth Control

would not be expected to change the proportion infertile.

Table C.1. Correlation of Epidemiological Infertility Below the Diagonal, Western Epidemiological Infertility Above the Diagonal

	Infert. W 1	Infert. W 2	Infert. W 3	Infert. W 4	Infert. W 5	Infert. W 6	Infert. W 7	Infert. W 8
Infert. W 1	–	0.21 ***	0.18 ***	0.15 ***	0.09 **	0.08 *	0.09 *	0.05
Infert. W 2	0.15 ***	–	0.30 ***	0.23 ***	0.12 **	0.09 *	0.04	0.06
Infert. W 3	0.13 ***	0.27 ***	–	0.45 ***	0.24 ***	0.19 ***	0.14 ***	0.13 **
Infert. W 4	0.12 ***	0.19 ***	0.44 ***	–	0.35 ***	0.23 ***	0.15 **	0.16 ***
Infert. W 5	0.07 *	0.12 ***	0.25 ***	0.37 ***	–	0.41 ***	0.23 ***	0.15 ***
Infert. W 6	0.10 **	0.09 **	0.19 ***	0.22 ***	0.43 ***	–	0.37 ***	0.22 ***
Infert. W 7	0.06	0.05	0.16 ***	0.14 ***	0.20 ***	0.38 ***	–	0.30 ***
Infert. W 8	0.06	0.05	0.13 **	0.15 ***	0.15 ***	0.21 ***	0.29 ***	–

Notes: *p < .05; **p < .01; ***p < .001

Table C.2. Correlation of Demographic 5 Year Infertility Below the Diagonal, Western Demographic 5 Year Infertility Above the Diagonal

	Infert. W 1	Infert. W 2	Infert. W 3	Infert. W 4	Infert. W 5	Infert. W 6	Infert. W 7	Infert. W 8
Infert. W 1	–	0.21 ***	0.16 **	0.17 ***	0.13 *	0.11 **	0.11 **	0.04
Infert. W 2	0.18 *	–	0.36 ***	0.31 ***	0.27 ***	0.23 ***	0.14 ***	0.11 *
Infert. W 3	0.12 *	0.35 ***	–	0.51 ***	0.34 ***	0.28 ***	0.22 ***	0.17 **
Infert. W 4	0.12 *	0.30 ***	0.53 ***	–	0.39 ***	0.28 ***	0.23 **	0.18 ***
Infert. W 5	0.08	0.28 ***	0.35 ***	0.41 ***	–	0.44 **	0.27 ***	0.18 **
Infert. W 6	0.08	0.21 ***	0.29 ***	0.27 ***	0.43 ***	–	0.44 ***	0.26 ***
Infert. W 7	0.08 *	0.13 **	0.23 ***	0.21 ***	0.22 ***	0.44 ***	–	0.27 **
Infert. W 8	0.02	0.09	0.14 ***	0.17 **	0.17 **	0.25 ***	0.26 **	–

Notes: *p < .05; **p < .01; ***p < .001

Table C.1 provides correlations between the basic measure of self-identification, uncertainty, and birth control use for the four waves for which the self-identified infertility measures are available. There is a weak, sometimes significant correlation between self-identified infertility and birth control use across waves; some women who self-identify still appear to use contraceptives. Conversely, there is a weak negative association (though generally non-significant) between uncertainty and birth control use. The negative correlation between birth control use and uncertainty implies that women who say that they don't know if they are infertile are less inclined to use contraceptives, and may even be actively testing their fertility to determine whether they are, in fact, infertile.

Table C.3. Correlation of Self-Identified Infertility Without Birth Control, Certainty, and BC Use

	Infert. W 1	Infert. W 6	Infert. W 7	Infert. W 8	Cert. W 1	Cert. W 6	Cert. W 7	Cert. W 8	Birth Control Use W1	Birth Control Use W6	Birth Control Use W7	Birth Control Use W8
Infert. W 1	1.00											
Infert. W 6	0.18 ***	1.00										
Infert. W 7	0.20 ***	0.47 ***	1.00									
Infert. W 8	0.12 ***	0.43 ***	0.47 ***	1.00								
Cert. W 1	-0.45 ***	-0.07 *	-0.08 ***	0.00	1.00							
Cert. W 6	-0.03	-0.49 ***	-0.27 ***	-0.25 ***	0.19 ***	1.00						
Cert. W 7	-0.01	-0.26 ***	-0.44 ***	-0.26 ***	0.19 ***	0.58 ***	1.00					
Cert. W 8	0.04	-0.28 ***	-0.29 ***	-0.50 ***	0.07 *	0.59 ***	0.59 ***	1.00				
BC Use W 1	0.08 *	0.05	0.04	0.04	-0.10	0.09	0.10 **	0.12 **	1.00			
BC Use W 6	0.08	-0.01	-0.01	0.02	-0.03	0.03	0.07	0.06	0.17 **	1.00		
BC Use W 7	0.06	0.02	0.03	0.05	-0.03	-0.01	0.00	-0.05	0.14 **	0.45 ***	1.00	
BC Use W 8	0.05	0.06	0.05	0.09	-0.02	-0.01	-0.04	-0.11	0.07	0.27 ***	0.31 ***	1.00

Notes: *p < .05; **p < .01; ***p < .001

Correlations between self-identified infertility and uncertainty across waves 1, 6, 7, and 8 are provided in Table C.1, with standard measures shown below the diagonal and western measures above the diagonal. Looking first at the correlation of self-identification with itself, the correlations are positive and, in most cases, significant. Correlations are substantially higher among waves 6 through 8 than with wave 1, though all correlations are fairly low compared to those observed among other measures. For instance, while the highest correlation among clinical measures is .47, the highest correlation among self-identification is .29. Once again, controlling for more or less stringent measures of birth control use does have an impact on the magnitude of correlations, but not in a systematic way.

Turning next to certainty, the patterns are similar to those for self-identification. Correlations are typically statistically significant, but lower than correlations among other measures, with the lowest correlations in the first wave. Controlling for different methods of birth control does not appear to make much difference. The correlations between infertility and certainty are low and generally non-significant. For the most part, the correlations are negative, though non-significant and positive in a few cases. This is unsurprising in light of the coding for these variables—recall, said "don't know", she was coded as uncertain, but not infertile, accounting for the negative relationship observed.

Table C.4. Correlation of Self-Identified Infertility and Certainty Below the Diagonal, Western Self-Identified Infertility and Certainty Above the Diagonal

	Infert. W 1	Infert. W 6	Infert. W 7	Infert. W 8	Infert. W 8	Certainty W 1	Certainty W 6	Certainty W 7	Certainty W 8
Infert. W 1	—	0.11 *	0.15 ***	0.10 **	0.10 **	-0.11 ***	-0.01	-0.01	0.00
Infert. W 6	0.08	—	0.26 ***	0.21 ***	0.21 ***	0.03	-0.09 ***	-0.05	-0.03
Infert. W 7	0.10 *	0.27 ***	—	0.29 ***	0.29 ***	0.06	-0.01	-0.07 **	0.00
Infert. W 8	0.07 *	0.20 ***	0.29 ***	—	0.04	0.04	-0.03	-0.04	-0.10 ***
Certainty W 1	-0.09 ***	0.03	0.04	0.04	—	—	0.14 ***	0.14 **	0.09
Certainty W 6	0.01	-0.08 **	0.02	-0.02	-0.02	0.15 **	—	0.32 ***	0.30 ***
Certainty W 7	0.01	-0.03	-0.06 *	-0.04	-0.04	0.15 **	0.32 ***	—	0.27 **
Certainty W 8	0.01	-0.01	0.01	-0.09 **	-0.09 **	0.09 *	0.29 ***	0.26 *	—

Notes: *p < .05; **p < .01; ***p < .001

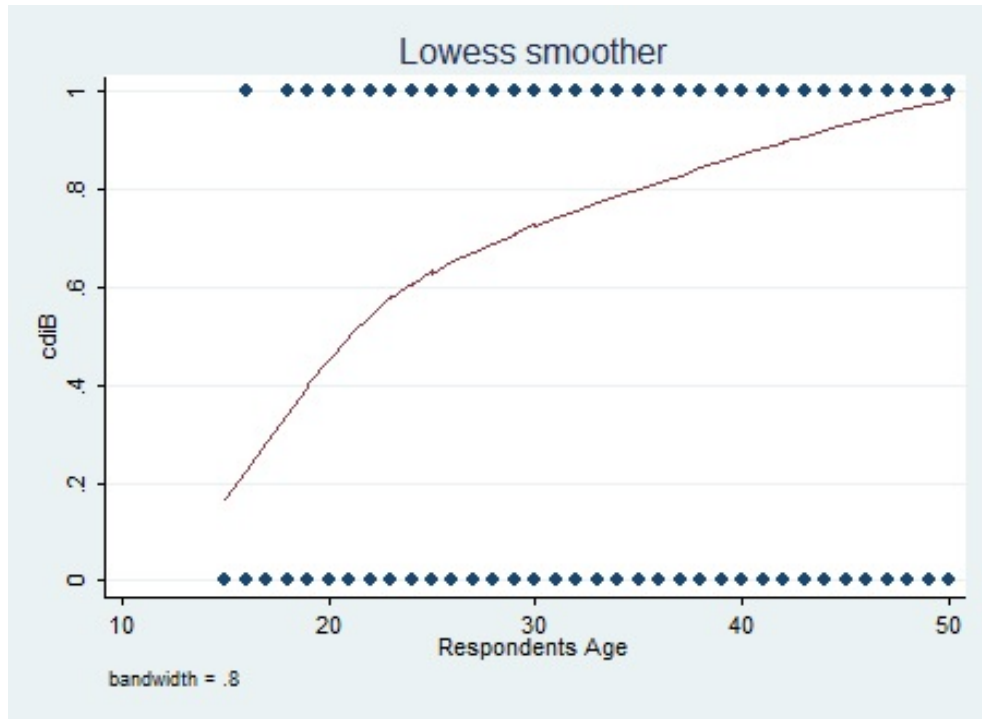


Figure C.3. Lowess Curve for Basic Clinical Infertility and Age

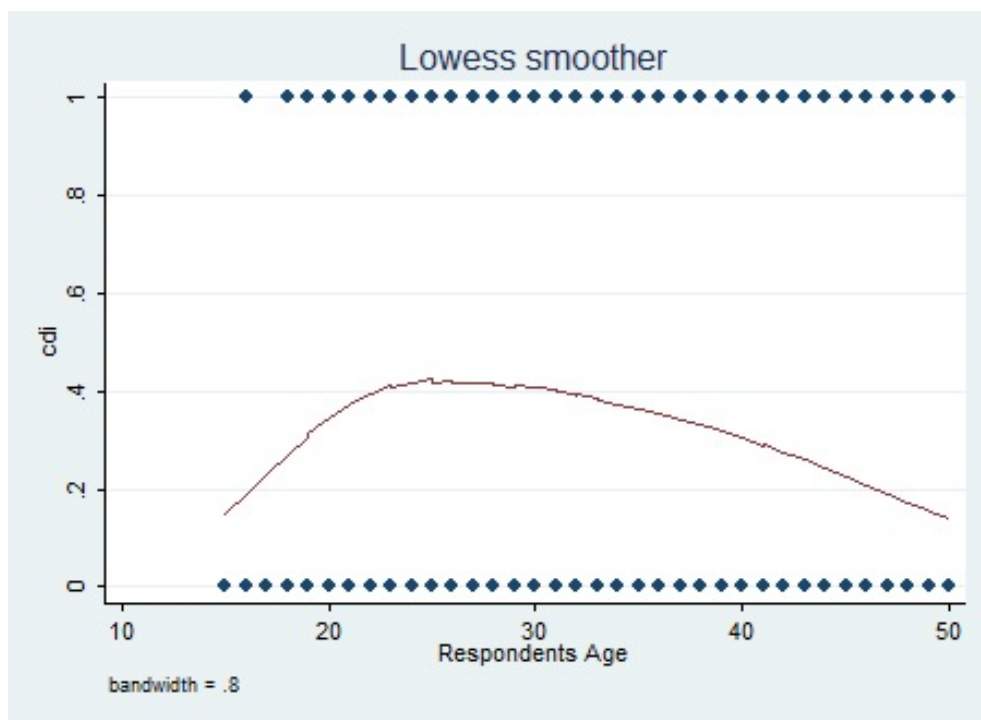


Figure C.4. Lowess Curve for Standard Clinical Infertility and Age

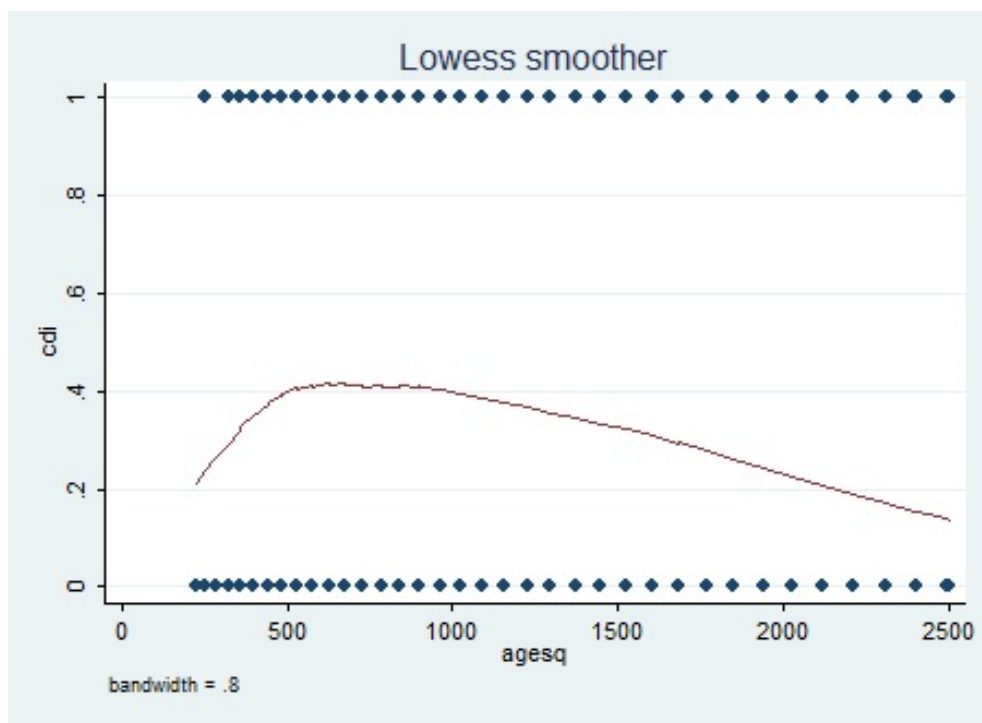


Figure C.5. Lowess Curve for Standard Clinical Infertility and Age Squared

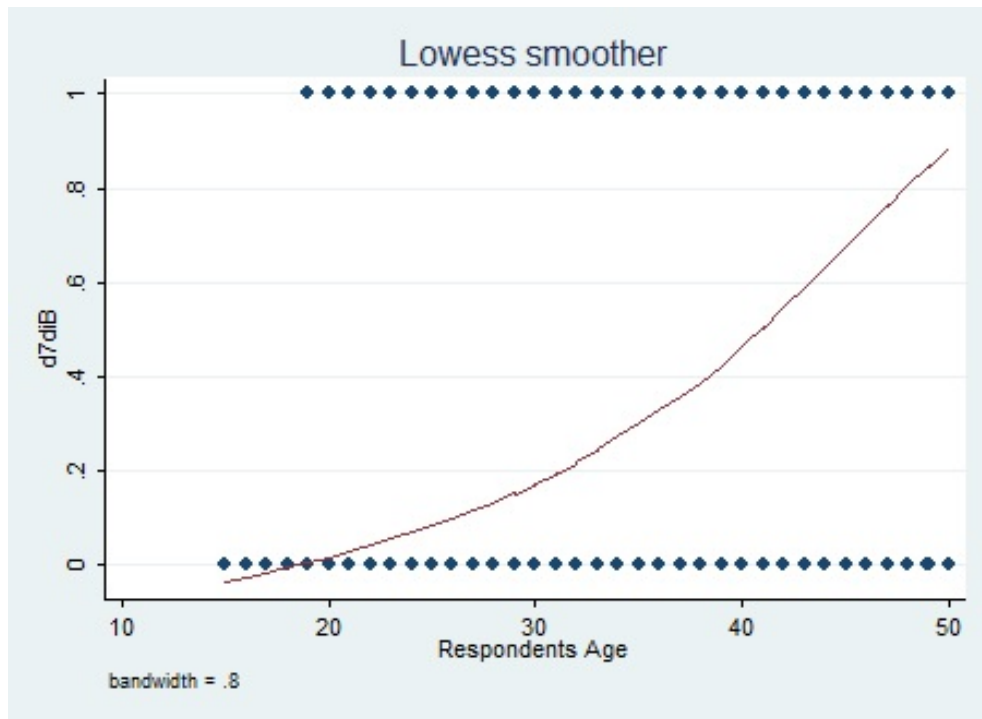


Figure C.6. Lowess Curve for Basic Demographic 7 Year Infertility and Age

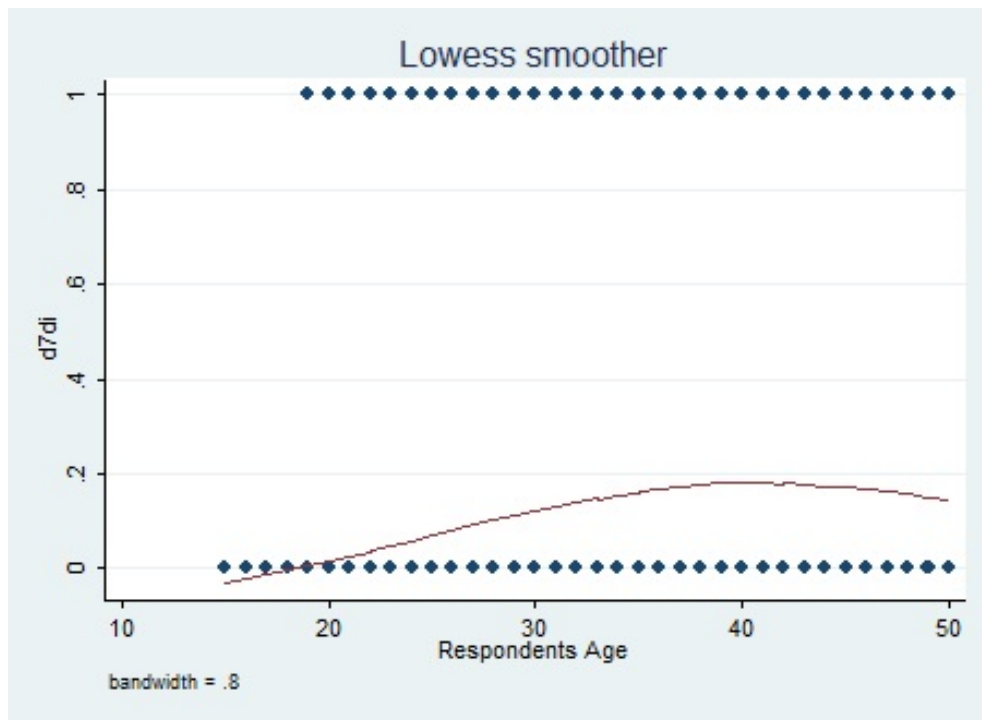


Figure C.7. Lowess Curve for Standard Demographic 7 Year Infertility and Age

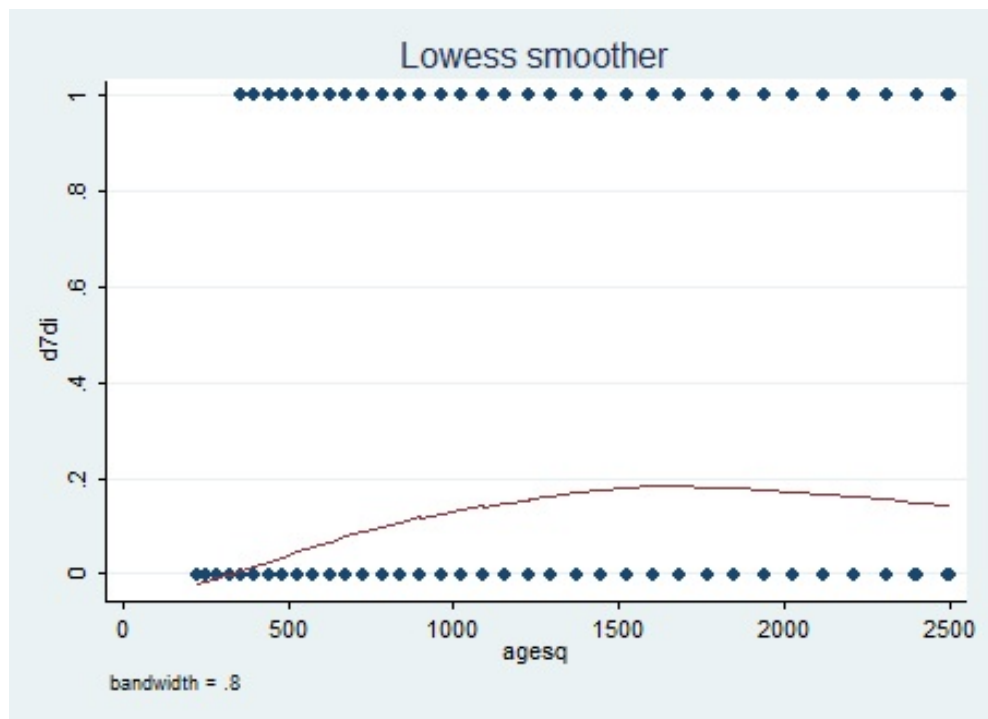


Figure C.8. Lowess Curve for Standard Demographic 7 Year Infertility and Age Squared

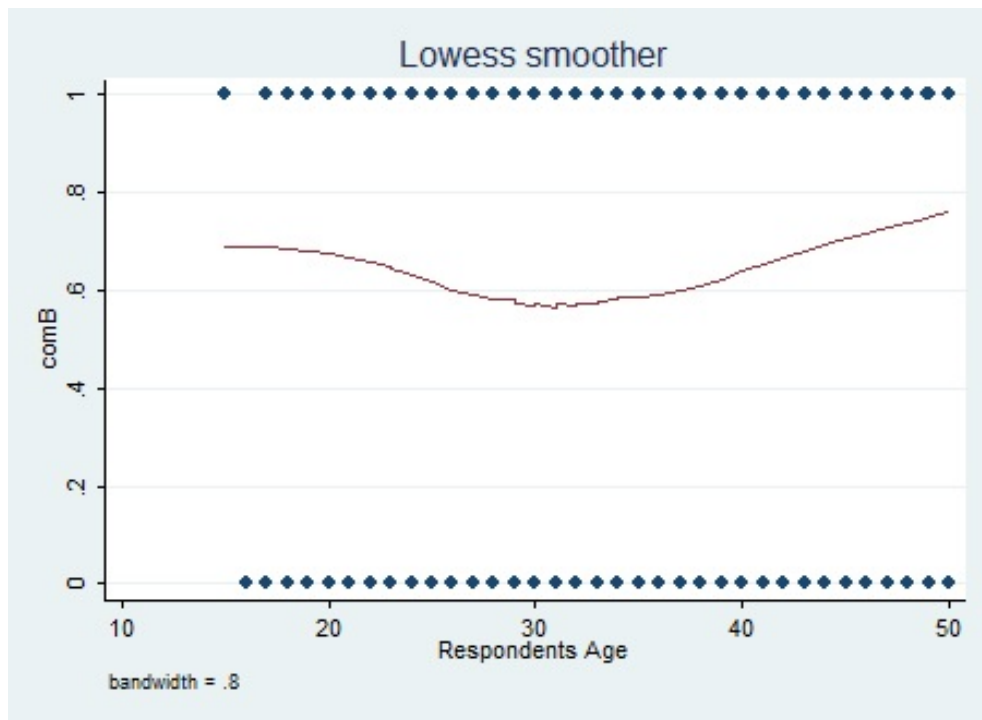


Figure C.9. Lowess Curve for Basic Combined Self-Identification and Age

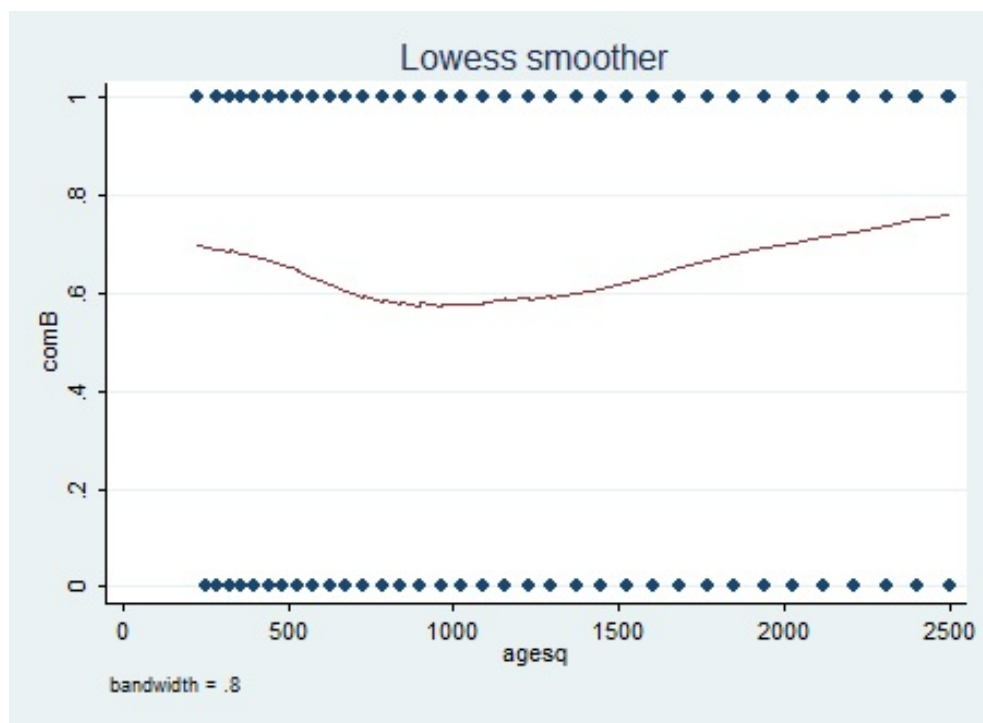


Figure C.10. Lowess Curve for Basic Combined Self-Identification and Age Squared

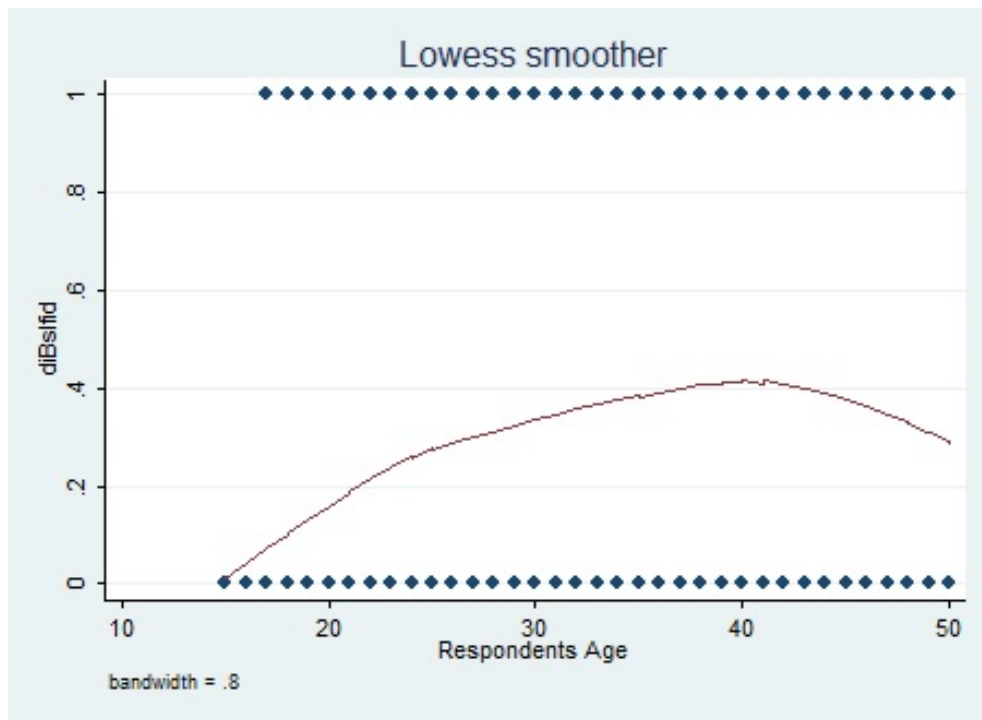


Figure C.11. Lowess Curve for Basic Self-Identification and Age

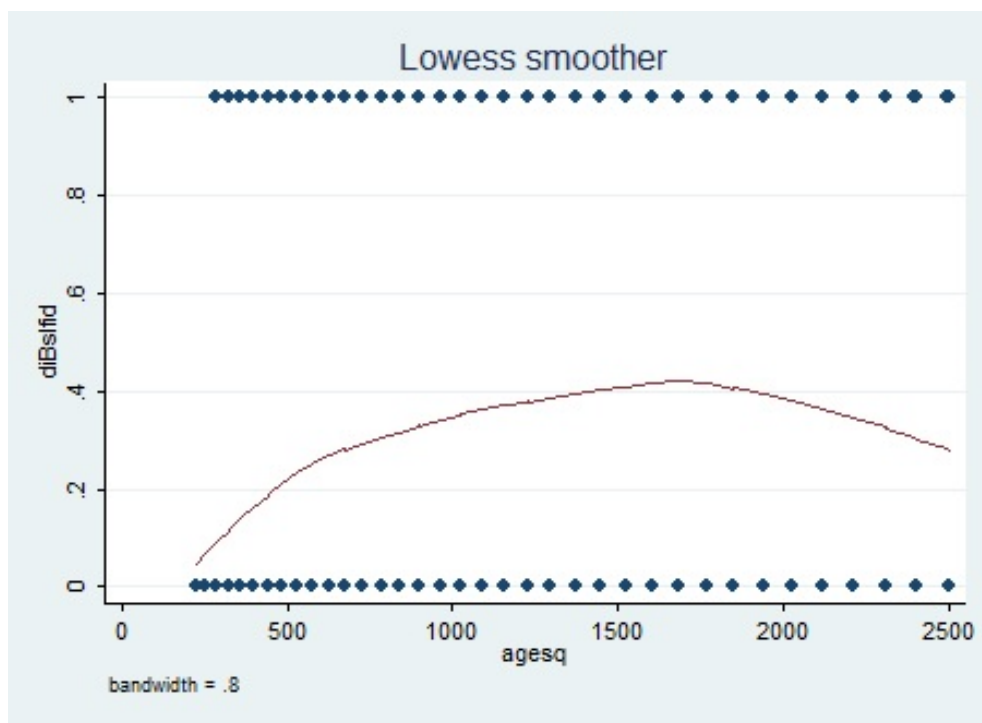


Figure C.12. Lowess Curve for Basic Self-Identification and Age Squared

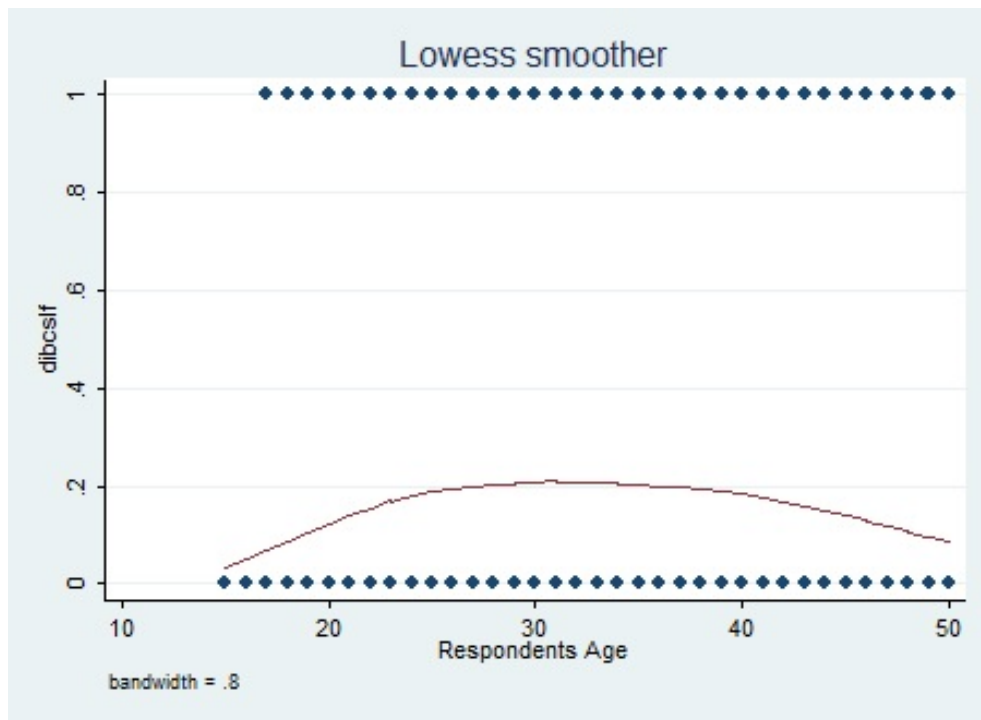


Figure C.13. Lowess Curve for Standard Self-Identification and Age

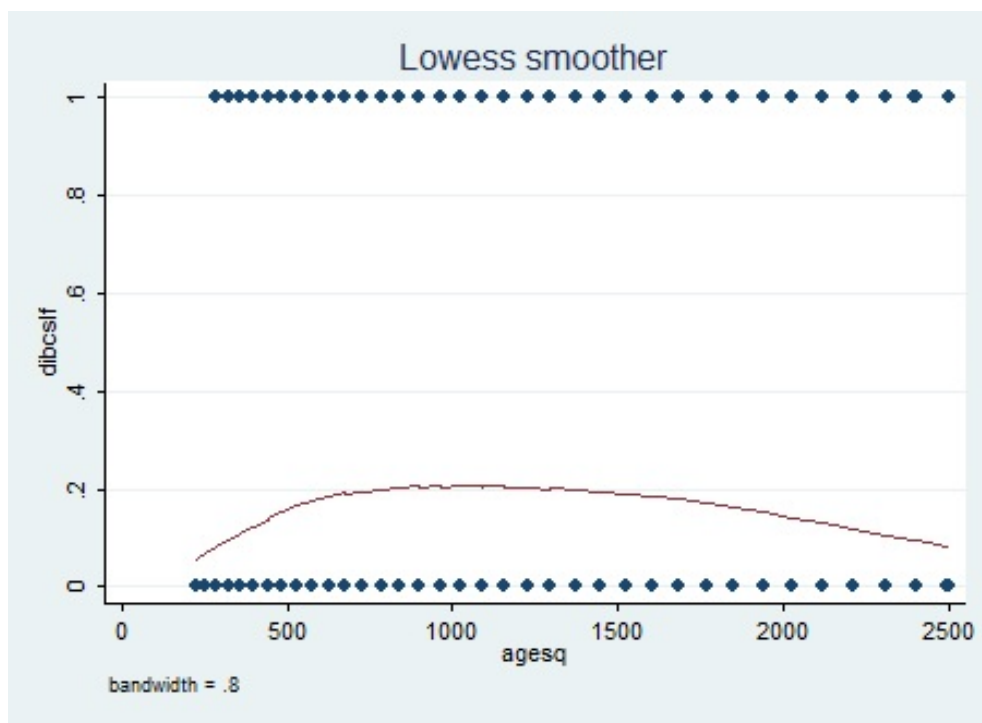


Figure C.14. Lowess Curve for Standard Self-Identification and Age Squared

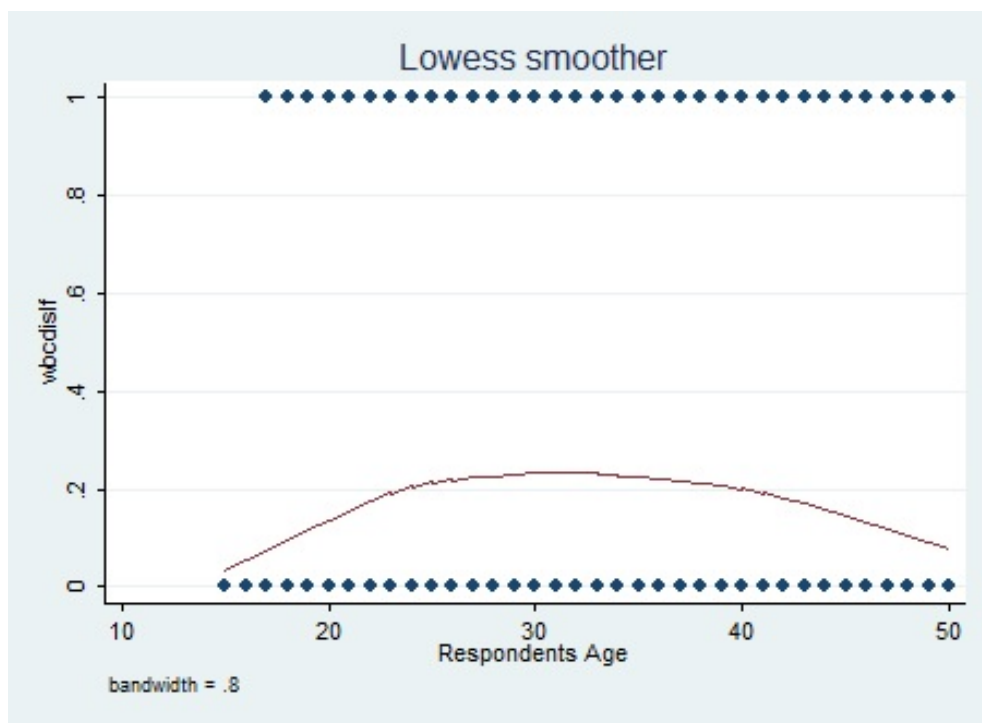


Figure C.15. Lowess Curve for Western Self-Identification and Age

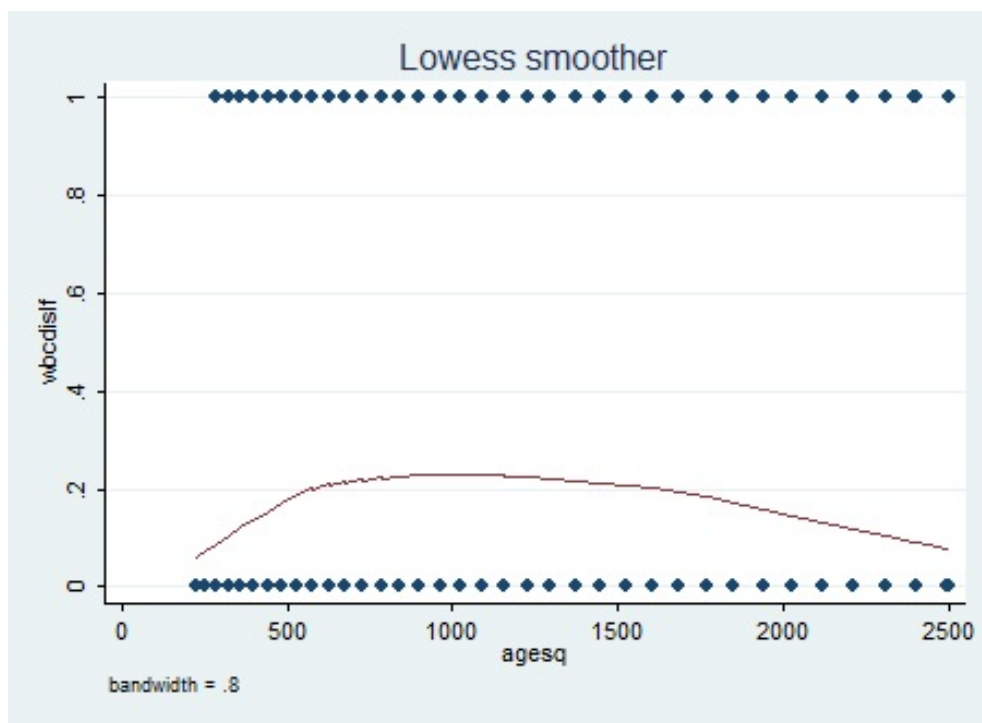


Figure C.16. Lowess Curve for Western Self-Identification and Age Squared

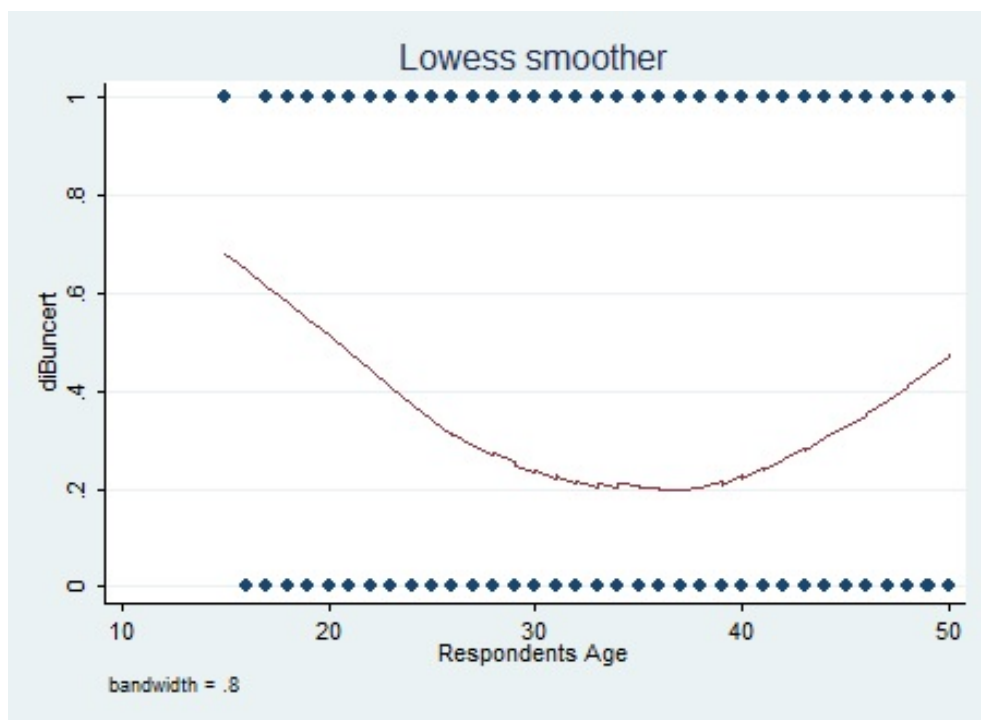


Figure C.17. Lowess Curve for Basic Uncertainty and Age

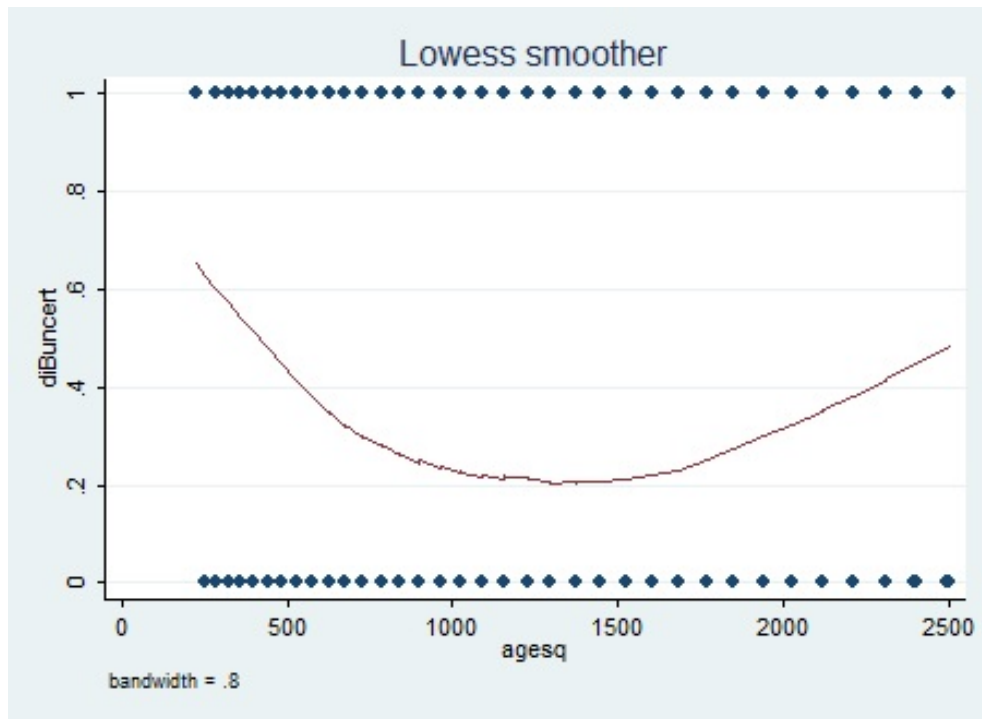


Figure C.18. Lowess Curve for Basic Uncertainty and Age Squared

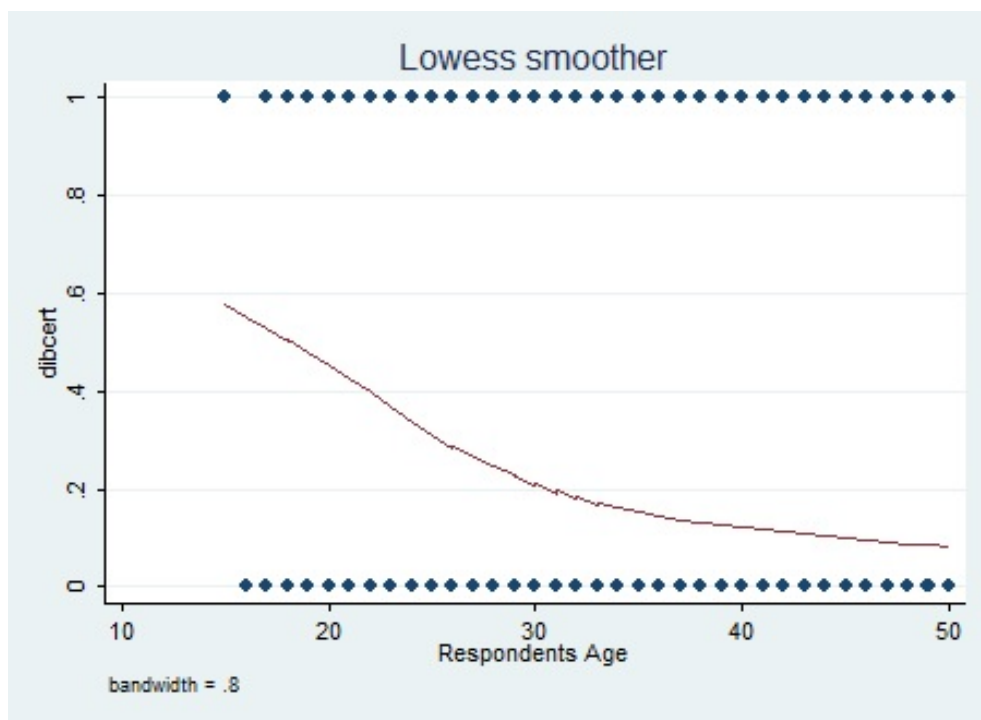


Figure C.19. Lowess Curve for Standard Uncertainty and Age

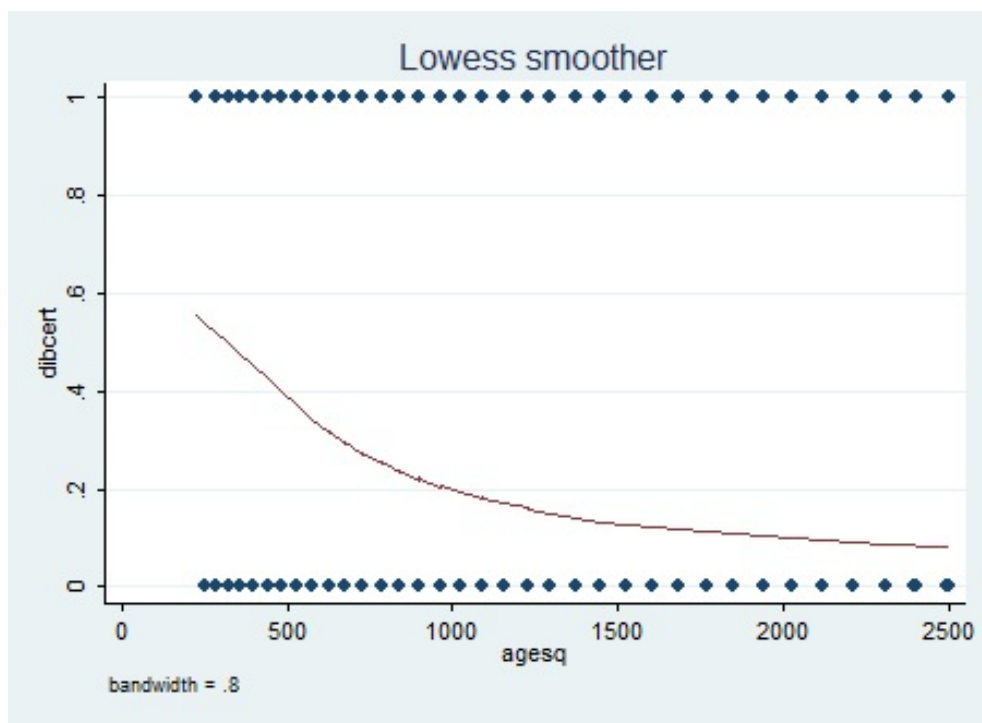


Figure C.20. Lowess Curve for Standard Uncertainty and Age Squared

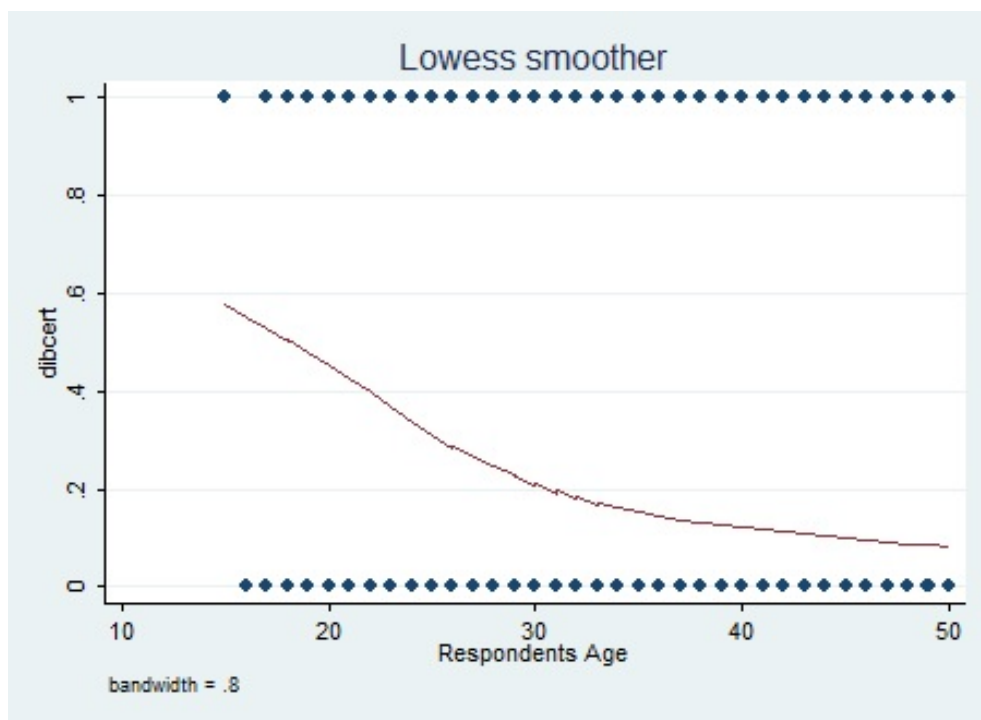


Figure C.21. Lowess Curve for Standard Uncertainty and Age

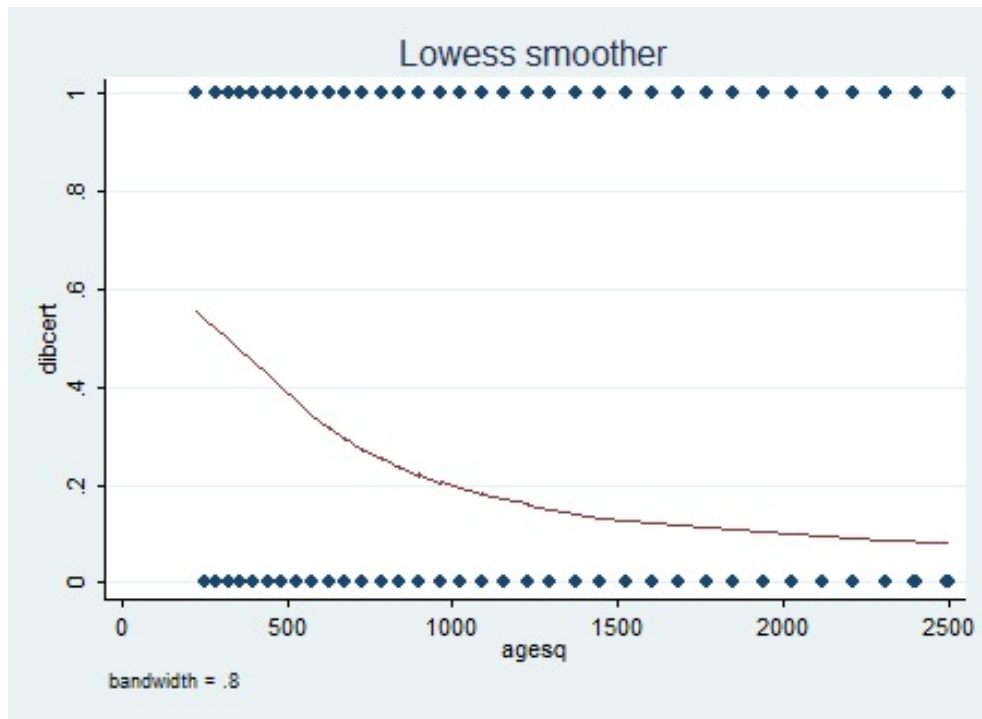


Figure C.22. Lowess Curve for Standard Uncertainty and Age Squared

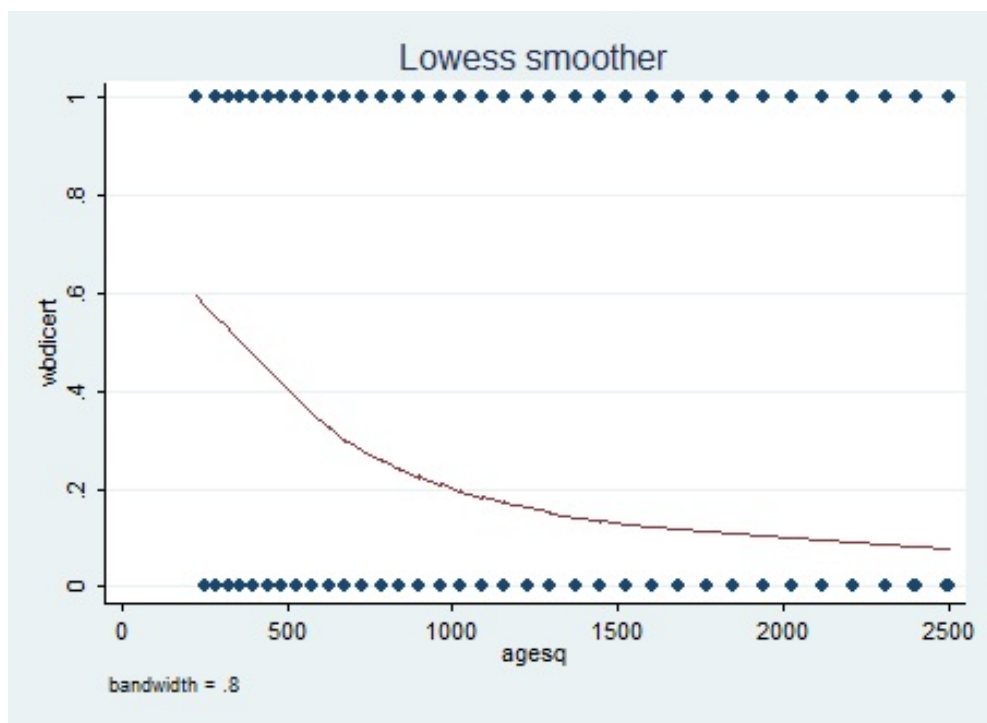


Figure C.23. Lowess Curve for Western Uncertainty and Age

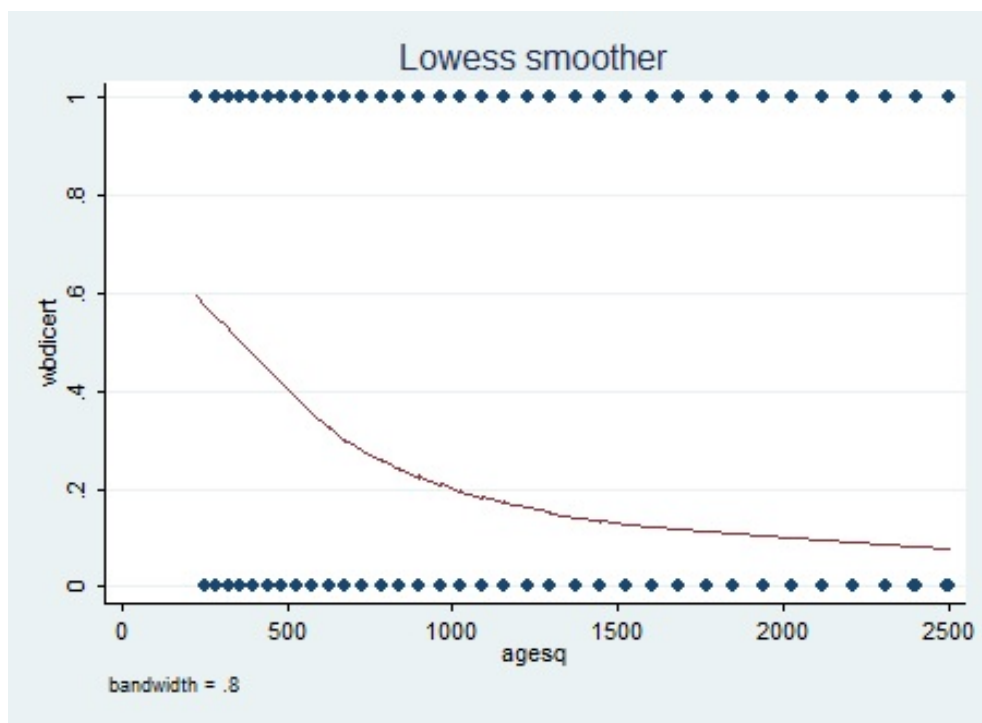


Figure C.24. Lowess Curve for Western Uncertainty and Age Squared

Table C.5. Random Effects Model of Self-Identified Infertility and Background Characteristics

	Basic			Standard			Standard			Western					
	Zero Order			Zero Order			Full Model			Zero Order			Full Model		
	OR	St. Error	St. Error	OR	St. Error	St. Error	OR	St. Error	St. Error	OR	St. Error	St. Error	OR	St. Error	St. Error
Age Squared	1.29	***	0.09	1.28	***	0.09	1.28	***	0.09	1.31	***	0.10	1.30	**	0.10
Age Squared	1.00	***	0.00	1.00	***	0.00	1.00	***	0.00	1.00	***	0.00	1.00	***	0.00
<i>Ethnicity</i>															
Adangbe	0.68	***	0.16	0.69	***	0.16	0.69	***	0.16	0.64	***	0.15	0.65	***	0.18
Ga or Ewe	0.91		0.22	0.92		0.22	0.92		0.22	0.87		0.19	0.88		0.19
Denkyira	0.88		0.21	0.88		0.21	1.02		0.27	0.80		0.18	0.94		0.24
Fante	0.77		0.15	0.82		0.15	0.82		0.17	0.82		0.15	0.88		0.16
Abanta or Other (reference)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Religious Affiliation</i>															
Catholic	1.04	**	0.38	0.90	*	0.34	0.90		0.34	1.07		0.36	0.94		0.33
Protestant	1.19		0.40	1.12		0.38	1.12		0.38	1.33		0.39	1.25		0.38
Moslem	1.03	***	0.37	1.00		0.37	1.00		0.37	1.06		0.33	1.09		0.35
Pentecostal or Charismatic	1.34		0.39	1.13		0.34	1.13		0.34	1.40		0.37	1.21		0.32
Syncretic, Traditional, or Other	1.25	*	0.37	1.21		0.37	1.21		0.36	1.43		0.37	1.37		0.35
None (reference)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: *p < .05; **p < .01; ***p < .001; Age squared divided by 1,000

Interestingly, a substantially different pattern emerges when we examine these relationships using models in which self-identification and uncertainty are treated separately. Table C.1 provides the results for self-identification, while Table C.1 shows the results for uncertainty. A curvilinear relationship between infertility and age holds across models. Figures C.1 through C.1 provide graphic displays of the curvilinear relationships presented in Tables C.1 and C.1.

Looking first at Table C.1, the odds ratios for age and age squared suggest a highly significant, positive relationship between age and the odds of identification as infertile. Basic self-identification rises sharply until around age 40, then declines steadily thereafter. Ethnicity and religious affiliation are also significant, in both the zero-order and full models. Once again, in the zero-order model, Adangbe respondents have significantly lower odds (OR=.68) of identification when compared to Ahanta or other ethnic groups. In terms of religious affiliation, Catholic (OR=1.04), Moslem (OR=1.03), and those identifying with Syncretic, Traditional, or Other religions (OR=1.25) are significantly more likely to self-identify than those with no religious affiliation. While ethnicity and religious affiliation remain significant in the full model, only Catholicism (OR=.90) remains significant—and the direction of the relationship has, in fact, reversed. Again, these findings point to the importance of contraceptive behavior in shaping the relationship between infertility, ethnicity, and religious identification.

The models for the standard and western self-identification measures reflect similar patterns to those observed for the basic measure. For instance, though the proportion identifying as infertile is lower using these measures, the general curvilinear relationship is similar: infertility rises until around age 30, declining steadily thereafter. Neither ethnicity nor religion were significant predictors in the models for standard or western measures.

Table C.1 provides results for the measure of uncertainty. In contrast to the findings for self-identification, the odds ratios for age suggest that for every year increase in age, there is a decline in the odds of identifying as uncertain. Unlike self-identification, basic uncertainty declines sharply until around age 35, then begins to rise. While ethnicity is a significant predictor of basic uncertainty (Adangbe and Denkyira respondents have higher odds of uncertainty), neither ethnicity nor religion are significant in the full model. Looking next at the standard and

Table C.6. Random Effects Model of Uncertainty and Background Characteristics

	Basic			Standard			Western					
	Zero Order			Zero Order			Zero Order					
	OR	St. Error	OR	St. Error	OR	St. Error	OR	St. Error	OR	St. Error		
Age Squared	0.52	0.02	0.52	0.02	0.73	0.06	0.73	0.06	0.71	0.05	0.72	0.05
<i>Ethnicity</i>	1.01	0.00	1.01	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Adangbe	1.53	**	1.45	0.31	1.42	0.41	1.14	0.40	1.59	0.44	1.33	0.45
Ga or Ewe	1.13		1.11	0.18	1.06	0.27	1.05	0.28	1.12	0.27	1.10	0.28
Denkyira	1.40	*	1.33	0.22	1.14	0.36	1.05	0.36	1.23	0.33	1.15	0.34
Fante	1.06		1.07	0.15	0.78	0.18	0.80	0.19	0.86	0.19	0.88	0.20
Abanta or Other (reference)	-	-	-	-	-	-	-	-	-	-	-	-
<i>Religious Affiliation</i>												
Catholic	1.10		0.97	0.17	1.77	0.60	1.33	0.45	1.66	0.47	1.24	0.36
Protestant	1.17		1.10	0.18	1.29	0.45	1.06	0.38	1.30	0.39	1.07	0.32
Moslem	1.15		0.84	0.18	1.69	0.62	0.96	0.42	1.60	0.53	0.87	0.32
Pentecostal or Charismatic	1.08		1.05	0.18	1.45	0.50	1.10	0.39	1.36	0.43	1.04	0.33
Syncretic, Traditional, or Other	0.78		0.75	0.13	0.94	0.37	0.84	0.32	0.87	0.33	0.78	0.28
None (reference)	-	-	-	-	-	-	-	-	-	-	-	-

Notes: *p < .05; **p < .01; ***p < .001; Age squared divided by 1,000

western measures of uncertainty, there is still a curvilinear relationship between age and infertility; however, as can be seen in Figures C.1 through C.1, the precise nature of this relationship has changed. The proportion infertile by the standard and western measures begins high, declining sharply with age until around age 35. Though infertility continues to decline thereafter (rather than increasing again, as with self-identification), the decline is very slight after age 35. The other background characteristics are not significant in the models for the standard and western measures.

Bibliography

Addai, Isaac and Frank Trovato. 1999. "Structural Assimilation and Ethnic Fertility in Ghana." *Journal of Comparative Family Studies* 10(3): 409-427.

Adepoju, Aderanti and Wariara Mbugua. 1997. "The African Family: An Overview of Changing Forms." in *Family, Population and Development in Africa*, edited by A. Adepoju. London: Zed Books Ltd.

Allen, Denise M. Roth. 2001. "Mchango, Menses and the Quality of Eggs: Women's Perceptions of Fertility Risks." Pp. 223-240 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Alwin, Duane. 2007. *Margins of Error*. Hoboken, NJ: John Wiley & Sons, Inc.

Amato, Paul R. and Stacy J. Rogers. 1997. "A Longitudinal Study of marital Problems and Subsequent Divorce." *Journal of Marriage and Family* 59(3): 612-624.

Anarfi, John Kwasi and Adobea Yaa Owusu. 2010. "The Making of a Sexual Being in Ghana: The State, Religion and the Influence of Society as Agents of Sexual Socialization." *Sexuality & Culture* 15(1):1-18.

Andrews, Frank, Antonia Abbey, and L. Jill Halman. 1991. "Stress

from Infertility, Marriage Factors, and Subjective Well-being of Wives and Husbands.” *Journal of Health and Social Behavior* 32 (3): 238-253.

Armstrong, Alice. 1997. “Law and the Family in Southern Africa.” Pp. 183-202 in *Family, Population and Development in Africa*, edited by A. Adepoju. London: Zed Books Ltd.

Aryee, A.F. 1997. “The African Family and Changing Nuptiality Patterns.” Pp. 78-96 in *Family, Population and Development in Africa*, edited by A. Adepoju. London: Zed Books Ltd.

Barden-O’Fallon, Janine. 2005. “Unmet Fertility Expectations and Perception of Fertility Problems in a Malawian Village.” *African Journal of Reproductive Health* 9:14-25.

Bledsoe, Caroline. 2002. *Contingent Lives: Fertility, Time, and Aging in West Africa*. Chicago: University of Chicago Press.

Blum, Robert. 2007. “Youth in Sub-Saharan Africa.” *Journal of Adolescent Health*. 41:230-238.

Boerma, J. Ties and Mark Urassa. 2001. “Associations Between Female Infertility, HIV and Sexual Behaviour in Rural Tanzania.” Pp. 175-188 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Bongaarts, John, Odile Frank, and Ron Lesthaeghe. 1984. “The Proximate Determinants of Fertility in Sub-Saharan Africa.” *Population and Development Review* 10: 511-537.

Bongaarts, J. and S. C. Watkins. 1996. “Social Interactions and Contemporary Fertility Transitions.” *Population and Development Review* 22: 639-682.

Booth, Alan, David R. Johnson, Lynn K. White, and John N. Edwards. 1986. "Divorce and Marital Instability over the Life Course." *Journal of Family Issues* 7(4): 421-442.

Box-Steffensmeier, Janet M. and Bradford S. Jones. 2004. *Event History Modeling: A Guide for Social Scientists*. Cambridge University Press: New York.

Allison, Paul D. 1995. *Survival Analysis Using SAS: A Practical Guide*. SAS Institute Inc.: car, NC.

Brockerhoff, M. 2008. "Fertility and Family Planning in African Cities: The Impact of Female Migration." *Journal of Biosocial Science* 27(03): 347-358.

Broekmans, F., E. Knauff, E. te Velde, N. Macklon, and B. Fauser. 2007. "Female Reproductive Ageing: Current Knowledge and Future Trends." *Trends in Endocrinology & Metabolism* 18(2): 58-65.

Caldwell, John C., I. O. Orubuloye, and Pat Caldwell. 1992. "Fertility Decline in Africa: A New Type of Transition?" *Population and Development Review* 18(2): 211-242.

Casterline, John. 1989. "Collecting Data on Pregnancy Loss: A Review of Evidence from the World Fertility Survey." *Studies in Family Planning* 20(2): 81-95

Casterline, John. 2007. "Social Learning, Social Influence, and Fertility Control." *Project Description*. Population Council and University of Cape Coast.

Central Intelligence Agency. 2011. Retrieved on March 1, 2011 from:

<https://www.cia.gov/library/publications/the-world-factbook/geos/gh.html>

Clarke, L.H., A. Martin-Matthews, and R. Matthews. 2006. "The Continuity and Discontinuity of the Embodied Self in Infertility." *The Canadian Review of Sociology and Anthropology* 43(1): 95-113.

Chester, Robert. 1972. "Is There a Relationship between Childlessness and Marriage Breakdown?" *Journal of Biosocial Science* 4: 443-454.

Demographic and Health Surveys. 2011. Retrieved on February 25, 2011 from: [http : //www.statcompiler.com/country.cfm?ctry_id = 14&Ctry_name = Ghana#](http://www.statcompiler.com/country.cfm?ctry_id = 14&Ctry_name = Ghana#)

Desrees du Lou, Annabel. 1999. "Reproductive Health and AIDS in Sub-Saharan Africa. Problems and Prospects." *Population: An English Selection* 11:61-87.

Dodoo, F. Nii-Amoo. 1998. "Marriage Type and Reproductive Decisions: A comparative Study in Sub-Saharan Africa." *Journal of Marriage and the Family* 60(1): 232-242.

Dodoo, F. Nii-Amoo. 1998. "Men Matter: Additive and Interactive Gendered Preferences and Reproductive Behavior in Kenya." *Demography* 35(2):229-242.

Dodoo, F. Nii-Amoo and Ashley E. Frost. 2008. "Gender in African Population Research: The Fertility/Reproductive Health Example/" *Annual Review of Sociology* 34: 431-452.

Dyer, S. J. 2007. "The Value of Children in African Countries: Insights from Studies on Infertility." *Journal of Psychosomatic Obstetrics & Gynecology* 28(2): 69-77.

Dyer, S.J., N. Abrahams, M. Hoffman, and Z.M. van der Spuy. 2002. "Men Leave Me as I Cannot Have Children': Women's Experiences with Involuntary Childlessness." *Human Reproduction* 17:1663-1668.

Dyer, S.J., N. Abrahams, N.E. Mokoena, C.J. Lombard, and Z.M. van der Spuy. 2005. "Psychological Distress among Women Suffering from Couple Infertility in South Africa: A Quantitative Assessment." *Human Reproduction* 20:1938-1943.

Dyer, S.J., N. Abrahams, N.E. Mokoena, and Z.M. van der Spuy. 2004. "'You Are a Man Because You Have Children': Experiences, Reproductive Health Knowledge And Treatment-Seeking Behaviour among Men Suffering from Couple Infertility in South Africa." *Human Reproduction* 19:960-967.

Ericksen, K. and Tracy Brunette. 1996. "Patterns and Predictors of Infertility among African Women: A Cross-National Survey Of Twenty-Seven Nations." *Social Science & Medicine* 42(2):209-220.

Ezeh, Alex Chika. 1993. "The Influence of Spouses over Each Other's Contraceptive Attitudes in Ghana." *Studies in Family Planning* 24:163-174.

Feldman-Savelsberg, Pamela. 2002. "Is Infertility an Unrecognized Public Health and Population Problem? The View from the Cameroon Grassfields." Pp. 215-232 in *Infertility around the globe: New thinking on childlessness, gender, and reproductive technologies*, edited by M. Inhorn and F. v. Balen. Berkeley: University of California Press. Frank, Odile. 1983. "Infertility in Sub-Saharan Africa: Estimates and Implications." *Population and Development Review* 9:137-144.

Geelhoed, D.W., D. Nayembil, K. Asare, J. H. Schagen van Leeuwen, and J. van Roosmalen. 2002. "Infertility in Rural Ghana." *International Journal of Gynecology and Obstetrics* 79(2): 137-142.

Gerrits, Trudie. 2002. "Infertility and Matrilineality: The Exceptional Case of the Macua of Mozambique." Pp. 233-246 in *Infertility Around the Globe: New Thinking on Childlessness, Gender, and Reproductive Technologies*, edited by M. Inhorn and F. v. Balen. Berkeley: University of California Press.

Gibson, Colin. 1980. "Childlessness and Marital Instability: A Re-Examination of the Evidence." *Journal of Biosocial Science* 12: 121-132.

Gijssels, Marjolein, Zaida Mgalla, and Lilian Wambura. 2001. "'No Child to Send': Context and Consequences of Female Infertility in Northwest Tanzania." Pp. 203-222 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Greil, A.L. 1991. *Not Yet Pregnant: Infertile Couples in Contemporary America*. New Brunswick: Rutgers University Press.

Greil, A. L. 1997. "Infertility and Psychological Distress: A Critical Review of the Literature." *Social Science and Medicine* 45(11): 1679-1704.

Greil, Arthur L., Julia McQuillan, Katherine Johnson, Katherine Slauson-Blevins, and Karina M. Shreffler. 2010. "The Hidden Infertile: Infertile Women without Pregnancy Intent in the United States." *Fertility and Sterility* 93(6): 2080-2083.

Greil, A.L. and J. McQuillan. 2004. "Help-Seeking Patterns among Subfecund Women." *Journal of Reproductive and Infant Psychology* 22:305-319.

Gyimah, Stephen Obeng, Baffour Takyi, and Eric Yeboah Tenkorang. 2008. "Denominational Affiliation and Fertility Behaviour in an African Context: An Examination of Couple Data from Ghana." *Journal of Biosocial*

Science 40: 445-458.

Huber, Joan and Glenna Spitze. 1980. "Considering Divorce; An Expansion of Becker's Theory of Marital Instability." *The American Journal of Sociology* 86(1): 75-89.

Inhorn, Marcia. 2003. "The Worms are Weak." *Men and Masculinities* 5:236-256.

Johnson, David. 1995. "Assessing Marital Quality in Longitudinal and Life Course Studies." in *Family Assessment*, edited by Jane Conoley and Elaine Buterick Werth. Buros Institute of Mental Measurements: Lincoln, NE.

Johnson, David. 1995. "Alternative Methods for the Quantitative Analysis of Panel Data in Family Research: Pooled Time-Series Models." *Journal of Marriage and the Family* 57:1065-1077.

Johnson, David R. and White, Lynn K. No Date. National Survey of Fertility Barriers [Computer File]. Population Research Institute [distributor]. The Pennsylvania State University. University Park, PA. Jose, Anita K., Daniel O'Leary and Anne Moyer. 2010. "Does Premarital Cohabitation Predict Subsequent Marital Stability and Marital Quality? A Meta-Analysis." *Journal of Marriage and Family* 72(1): 105-116.

Kirk, Dudley. 1996. "Demographic Transition Theory." *Population Studies* 50:361-387.

Koster-Oyekan, Winny. 1999. "Infertility among Yoruba Women: Perceptions on Causes, Treatments and Consequences." *African Journal of Reproductive Health* 3:13-26.

Larsen, Ulla. 1994. "Sterility in Sub-Saharan Africa." *Population Studies* 48:459-474.

Larsen, Ulla. 1996. "Childlessness, Subfertility, and Infertility in Tanzania." *Studies in Family Planning* 27:18-28.

Larsen, Ulla. 1997. "Fertility in Tanzania: Do Contraception and Sub-Fertility Matter?" *Population Studies* 51:213-220. Larsen, Ulla. 2000. "Primary and Secondary Infertility in Sub-Saharan Africa." *International Journal of Epidemiology* 29:285-291.

Larsen, Ulla. 2005. "Research on Infertility: Which Definition Should We Use." *Fertility and Sterility* 83:846-852.

Larsen, Ulla and Han Ragers. 2001. "Levels and Trends in Infertility in Sub-Saharan Africa." Pp. 25-70 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Leonard, Lori. 2002. "Problematizing Fertility: "Scientific" Accounts and Chadian Women's Narratives." Pp. 193-214 in *Infertility Around the Globe: New Thinking on Childlessness, Gender, and Reproductive Technologies*, edited by M. Inhorn and F. v. Balen. Berkeley: University of California Press.

Lichter, Daniel T. and Zhenchao Qian. 2008. "Serial Cohabitation and the Marital Life Course." *Journal of Marriage and Family* 70(4): 861-878.

Lunenfeld, B. and A. Van Steirteghem. 2004. "Infertility in the Third Millennium: Implications for the Individual, Family and Society: Condensed Meeting Report from the Bertarelli Foundation's Second Global Conference." *Human Reproduction Update* 10:317-326.

Marchbanks, Polly A., Herbert B. Peterson, George L. Rubin, Phyllis A. Wingo, and the Cancer and Steroid Hormone Study Group. 1989.

“Research on Infertility: Definition Makes a Difference.” *American Journal of Epidemiology* 130(2): 259-268.

Mayaud, Philippe. 2001. “The Role of Reproductive Tract Infections.” Pp. 71-108 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Mbugua, Wariara. 1997. “The African Family and the Status of Women’s Health.” Pp. 139-157 in *Family, Population and Development in Africa*, edited by A. Adepoju. London: Zed Books Ltd.

McCloskey, Laura Ann, Corrine Williams, and Ulla Larsen. 2005. “Gender Inequality and Intimate Partner Violence among Women in Moshi, Tanzania.” *International Family Planning Perspectives* 31:124-130.

Meekers, Dominique. 1992. “The Process of Marriage in African Societies: A Multiple Indicator Approach.” *Population and Development Review* 18(1):61-78.

Meekers, Dominique. 1994. “Sexual Initiation and Premarital Child-bearing in Sub-Saharan Africa.” *DHS Working Papers* 5:1-26.

Meekers, Dominique and Anne-Emmanule Calvs. 1997. “‘Main’ Girl-Friends, Girlfriends, Marriage, and Money: The Social Context of HIV Risk Behaviour in Sub-Saharan Africa.” *Health Transition Review* 7(supplement): 361-375.

Meekers, Dominique and Anne-Emmanule Calvs. 1999. “Gender Differentials in Adolescent Sexual Activity and Reproductive Health Risks in Cameroon ” *African Journal of Reproductive Health* 3:51-67.

Mgalla, Zaida and J. Ties Boerma. 2001. “The Discourse of Infertility

in Tanzania.” Pp. 189-202 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Miall, Charlene E. 1986. “The Stigma of Involuntary Childlessness.” *Social Problems* 33 (4): 268-282.

Miles, Matthew B. and Michael Huberman. 1994. *Qualitative Data Analysis: An Expanded Sourcebook*. (2nd Edition). Thousand Oaks, CA: Sage Publications, Inc.

Mogobe, D. 2005. “Denying and Preserving Self: Batswana Women’s Experiences of Infertility.” *African Journal of Reproductive Health* 9(2): 26-37.

Moreland, Scott and David Logan. 2000. “Modeling Adolescent Reproductive Health in Ghana. An Application of the ARH Model.” *USAID Policy Project*. Retrieved March 8, 2011 from: www.policyproject.com/pubs/ghanamodel.pdf

Mueller, K. A. and J. D. Yoder. 1999. “Stigmatization of Non-Normative Family Size Status.” *Sex Roles* 41(11/12): 901-919.

Oheneba-Sakyi, Yaw. 1999. *Female Autonomy, Family Decision Making, and Demographic Behavior in Africa*. The Edwin Mellen Press: Lewiston, NY.

Okonofua, Friday. 1999. “Infertility and Women’s Reproductive Health in Africa.” *African Journal of Reproductive Health* 3:7-12.

Oppong, Christine. 1997. “African Family Systems and Socio-Economic Crisis.” in *Family, Population and Development in Africa*, edited by A. Adepoju. London: Zed Books Ltd.

Oppong, Christine and Katharine Abu. 1987. *Seven Roles of Women:*

Impact of Education, Migration and Employment on Ghanaian Mothers. In Women, Work, and Development Series. Geneva: International Labour Office.

Parry, D.C. 2005. "Work, Leisure, and Support Groups: An Examination of the Ways Women with Infertility Respond to Pronatalist Ideology." *Sex Roles* 53(5/6): 337-46.

Pearce, T. O. 1999. "She Will Not Be Listened To In Public: Perceptions among the Yoruba of Infertility and Childlessness in Women." *Reproductive Health Matters* 7(13): 69-79.

Peterson, B.D., C.R. Newton, and K.H. Rosen. 2003. "Examining Congruence Between Couples' Perceived Infertility Related Stress and Its Relationship to Depression and Marital Adjustment in Infertile Men and Women." *Family Process*, 42: 59-71.

Phillips, Julie A. and Megan M. Sweeney. 2003. "Premarital Cohabitation and the Risk of Marital Disruption among White, Black, and Mexican American Women." *On-Line Working Paper Series, California Center for Population Research*: UC Los Angeles: 1-42.

Pool, Robert and Ndatulu Robert Washija. 2001. "Traditional Healers, STDs and Infertility in Northwest Tanzania." Pp. 241-256 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Reinhold, Steffen. 2010. "Reassessing the Link Between Premarital Cohabitation and Marital Instability." *Demography* 47(3): 719-733.

Richards, Sarah. 2002. "'Spoiling the Womb': Definitions, Aetiologies, and Responses to Infertility in North West Province, Cameroon." *African Journal of Reproductive Health* 6:84-94.

Robinson, Warren C. 1997. "The Economic Theory of Fertility Over Three Decades." *Population Studies* 51:63-74.

Rothman, B.K. 1989. *Recreating Motherhood: Ideology and Technology in a Patriarchal Society*. New York: W.W. Norton & Company.

Rural Poverty Portal. 2011. Retrieved on March 1, 2011 from: <http://www.ruralpovertyportal.org/web/guest/country/statistics/tags/ghana>

Salm, Steven J. and Toyin Falola. 2002. *Culture and Customs of Ghana*. Greenwood Press: Westport, CT.

Singer, Judith D. and John B. Willett. 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. New York: Oxford University Press.

Smith, J.F., T.J. Walsh, A.W. Shindel, P.J. Turek, H. Wing, L. Pasch, and P.P. Katz. 2009. "Sexual, Marital, and Personal Impact of a Man's Perceived Infertility Diagnosis." *Journal of Sexual Medicine* 6(9): 2505-15.

South, Scott J. and Glenna Spitze. 1986. "Determinants of Divorce over the Marital Life Course." *American Sociological Review* 51(4): 583-590.

Stephen, E.H., and Chandra, A. 2006. "Declining Estimates of Infertility in the United States: 1982-2002." *Fertility & Sterility* 86(3): 516-23.

Strauss, Anselm L. 1987. *Qualitative Analysis for Social Scientists*. New York: Cambridge University Press.

Sundby, Johanne. 2002. "Infertility and Health Care in Countries with Less Resources: Case Studies from Sub-Saharan Africa." Pp. 247-260 in *Infertility around the globe: New thinking on childlessness, gender, and reproductive technologies*, edited by M. Inhorn and F. v. Balen. Berkeley:

University of California Press.

Sundby, Johanne and Aeileen Jacobus. 2001. "Health and Traditional Care for Infertility in the Gambia and Zimbabwe." Pp. 257-268 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Takyi, Baffour K. 2003. "Perspectives on Family and Marital Processes in Ghana." Pp. 743-748 in *International encyclopedia of marriage and family relationships*, 2nd edition, edited by James J. Ponzetti. New York, NY: McMillan Press.

Takyi, Baffour K. and Christopher L. Broughton. 2006. "Marital Stability in Sub-Saharan Africa: Do Women's Autonomy and Socioeconomic Situation Matter?" *Journal of Family and Economic Issues* 27(1): 113-132.

Takyi, Baffour K. and Stephen Obeng Gyimah. 2007. "Matrilineal Family Ties and Marital Dissolution in Ghana." *Journal of Family Issues* 28(5): 682-705.

Teachman, Jay. Forthcoming. "Multilevel Random- and Fixed-Effects Models for Discrete-Time Event History Data." *Journal of marriage and Family*

Turner, Barry (ed.). 2006. *The Statesman's Yearbook*. New York: Palgrave Macmillan.

Unicef. 2011. Retrieved February 26th, 2011 from: http://www.unicef.org/infobycountry/ghana_statistics.html

Upkong, D. and E. Orji 2006. "Mental Health of Infertile Women in Nigeria." *Turkish Journal of Psychiatry* 17(4): 1-7.

U.S. Census Bureau. 2011. Retrieved on March 1, 2011 from:
<http://www.census.gov/ipc/www/idb/country.php>

Varga, Christine A. 2003. "How Gender Roles Influence Sexual and Reproductive Health Among South African Adolescents." *Studies in Family Planning* 34:160-172.

White, Richard G., Basia Zaba, J. Ties Boerma, and John Blacker. 2001. "Modeling the Dramatic Decline of Primary Infertility in Sub-Saharan Africa." Pp. 117-150 in *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*, edited by J. T. Boerma and Z. Mgalla. Amsterdam: KIT Publishers.

Wright, J., C. Duchesne, S. Sabourin, F. Bissonnette, J. Benoit, and Y. Girard. 1991. "Psychosocial Distress and Infertility: Men and Women Respond Differently." *Fertility and Sterility* 55:100-8.

World Bank. 2011. Retrieved on March 1, 2011 from:
<http://data.worldbank.org/country/ghana>

Zabin, Laurie Schwab and Karungari Kiragu. 1998. "The Health Consequences of Adolescent Sexual and Fertility Behavior in Sub-Saharan Africa." *Studies in Family Planning* 29:210-232.

Vita
Jasmine Fledderjohann

EDUCATION

2011 Dual Ph.D., Sociology and Demography, Pennsylvania State University
2007 Dual M.A., Sociology and Demography, Pennsylvania State University
2004 B.A., Sociology (Cum Laude), Family and Lifecycles Emphasis, University of Alaska-Anchorage

PROFESSIONAL EXPERIENCE

2005-2011 Research Assistant, Pennsylvania State University
2007-2011 Instructor/Teaching Assistant, Pennsylvania State University

PEER-REVIEWED JOURNAL ARTICLES

Fledderjohann, Jasmine and David R. Johnson. "What Predicts the Actions Taken Toward Observed Child Neglect? The Effects of Community Context and Individual Characteristics." Conditionally accepted for publication at *Social Science Quarterly*.

MANUSCRIPTS INVITED FOR REVISION

Johnson, Katherine M. and Jasmine Fledderjohann. "Revisiting 'Her' Infertility: Links between Infertility Diagnosis and Response."

GRANTS AND AWARDS

2010 Demography Program Dissertation Research Assistantship
2010 ICPSR/NCFMR Summer Workshop Travel Grant
2010 Population Research Institute Conference Travel Award
2009 Department of Sociology Conference Travel Award
2008 Huber-Form Research Grant, Pennsylvania State University
2008 William and Flora Hewlett Foundation Travel Grant
2008 Department of Sociology Conference Travel Award
2000 to 2004 Student Leadership Honors, UAA Chancellor's List, UAA Dean's List, Sociology Departmental Honors, Nominee, USAA National Collegiate Social Sciences Award, Alpha Kappa Delta, Golden Key, National Dean's List