UNIVERSITY OF SOUTHAMPTON

FACULTY OF LAW, ARTS & SOCIAL SCIENCES

School of Social Sciences

Three papers on Side Effects and Modern Contraceptive Use among Women in Ghana

by

Claire Elizabeth Bailey

Thesis for the degree of Doctor of Philosophy

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ABSTRACT

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THREE PAPERS ON SIDE EFFECTS AND MODERN CONTRACEPTIVE USE AMONG WOMEN IN GHANA

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This thesis investigates the issue of side effects and how they may act as a barrier to the use of modern contraceptive methods among women in Ghana. Three papers are presented each addressing the issue using different sources of data and different methodologies. The disparate nature of the data sources and techniques used provides each paper with its own perspective on the research question and each paper gives a unique insight into the topic.

The aim of the first paper is to use a qualitative focus group methodology to explore in-depth the way individuals perceive information about family planning. The study seeks to better define what is meant by the term fear of side effect in this particular social context and to determine on what information and from what sources is this fear constructed. Overall the findings of this study show that fear of side effects does act as a significant barrier to the use of temporary methods and these fears result mainly from a large amount of negative information regarding side effects being passed through the social network. However the events being recounted cannot be dismissed as myth or rumour as they are most often based in real experiences.

The second paper uses monthly data on contraceptive use and the experience of side effects from the calendar section of a longitudinal survey of women in Southern Ghana. Using life tables and a multi-level logistic discrete-time hazards model this study analyses contraceptive discontinuation and how it relates to the concurrent self-reported experience of side effects. The results show that experiencing side effects is associated with a higher probability of discontinuation of the method and that counselling from health workers is extremely important in minimizing discontinuation rates.

The third paper uses a sub-sample of women who are not current contraceptive users from the 2003 GDHS. The study uses multiple logistic regression to determine the association between exposure to family planning information, through mass media and interpersonal channels, and the probability that a respondent will cite fear of side effects as their main reason for not intending to use a contraceptive method in the future. The results show that the only family planning communication variable which does have a significant effect is receiving a message from a health worker which increases the odds of fear of side effects being the main reason for not intending to use a method in the future. Overall the socio-economic characteristics of those not intending to use a method in the future due to a fear of side effects is more similar to current users than to those who are not intending to use in the future for other reasons.

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DECLARATION OF AUTHORSHIP

I, Claire Elizabeth Bailey, declare that the thesis entitled

'Three papers on Side Effects and Modern Contraceptive Use among Women in Ghana'

and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- none of this work has been published before submission

Signed: .....

Date:.....

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List of Acronyms

CBD	Community Based Distribution
CCFCS	Cape Coast Social Learning, Social Influence and Fertility Control Survey
CPR	Contraceptive Prevalence Rate
DHS	Demographic and Health Survey
DMPA	Depot Medroxyprogesterone Acetate (Brand name: Depo Provera)
FGD	Focus Group Discussion
GDHS	Ghana Demographic and Health Survey
GHS	Ghana Health Services
GPRS	Ghana Poverty Reduction Strategy
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
IEC	Information Education Communication
IUD	Inter-Uterine Device
LAM	Lactational Amenorrhea Method
MDGs	Millennium Development Goals
PPAG	Planned Parenthood Association of Ghana
TFR	Total Fertility Rate
UCC	University of Cape Coast
UN	United Nations
UNESCO	United Nations Educational Cultural and Scientific Organization
WHO	World Health Organization

Chapter One

Introduction

This document presents a study on the topic of contraceptive use among women in Ghana. One of the issues which is consistently raised in studies of contraceptive use in sub-Saharan Africa is the non-use of contraceptive methods due to fear of side effects or detrimental health effects. The specific focus of the study is the fear of side effects as a barrier to the use of modern contraceptive methods and the overall research questions are as follows:

- In what way does fear of side effects influence contraceptive behaviour and function as a barrier to the use of modern or hormonal methods among women in Ghana?
- Is the fear of side effects and subsequent contraceptive behaviour influenced by exposure to different sources of family planning information?

The thesis is presented in a three-paper format where a variety of data and methods are employed to fully explore the topic. This introductory chapter begins by explaining the rationale behind the study. It then presents information on the background context in relation to fertility and contraceptive use in Ghana. Finally the aims of the study are stated and the structure of the thesis outlined.

1.1: Rationale for Study

Ghana was the first country in Sub-Saharan Africa to implement an official population policy in 1969 in response to the recognition by the government of high fertility, a high population growth rate and their potentially detrimental consequences on social and economic development. This policy had only a modest impact prior to the early 1990's due to lack of political commitment and was revised in 1994 to integrate population issues in development planning and to take account of emerging issues such as the HIV/AIDS epidemic (Ghana Statistical Service et al, 2004). The total fertility rate (TFR) then declined sharply from 6.4 in 1988 to 4.6 in 1998, however this decline has subsequently stalled and the TFR has remained at 4.4 between 1998 and 2003 (Ghana Statistical Service et al, 2004).

A wealth of empirical evidence shows a strong correlation between the TFR and the contraceptive prevalence rate (CPR) at national level. As such family planning policy and programmes aimed at increasing contraceptive use accomplish the concurrent aims of improving mother and child health, enabling reproductive freedom of choice and lowering the TFR. As part of the Ghana Poverty Reduction Strategy (GPRS) in 1995 the Vision 2020 Plan of Action was adopted of which the central aims are to eradicate poverty, accelerate economic development and enhance the quality of life for all citizens. The ultimate goal of Vision 2020 is for Ghana to become classified as a middle-income country by 2020. One aim of Vision 2020 is to have a CPR of modern methods of 50% by 2020 (World Bank, 2003). The strategy for achieving this aim is firstly to decentralize service delivery and expand the availability of contraceptives and secondly to implement a national campaign on fertility regulation. This includes a comprehensive, systematic, and culturally sensitive information, education and communication (IEC) programme to promote the use of family planning (World Bank, 2003).

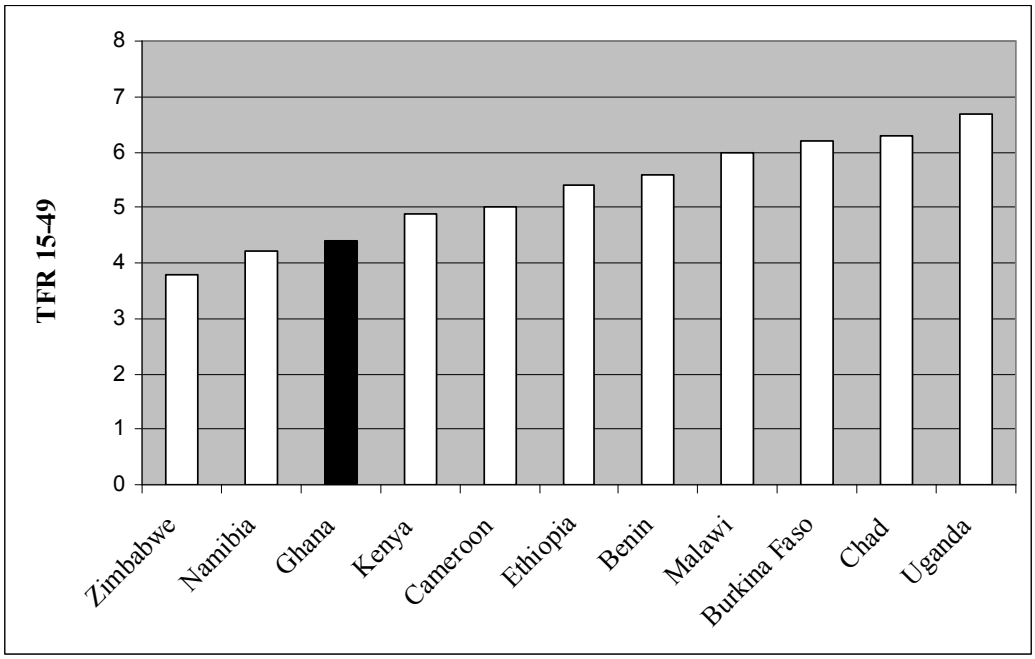
The Millennium Development Goals (MDGs) were developed by the United Nations (UN) to focus the efforts of the international community on to key development issues and to introduce measurable goals and targets. The original declaration in 2000 introduced eight major goals with associated targets. The year 2007 marked the mid-way point between the adoption of the framework and the original target date of 2015. At this mid-point some progress had been made but several countries in sub-Saharan Africa are not on track to achieve any of the goals. The 2007 report of the Secretary General of the United Nations acknowledged with reference to the MDGs that poor access to health care and reproductive health services is one of the pervasive challenges to meeting the goals (United Nations, 2007). When the goal monitoring framework was revised in 2007 by the Inter-Agency and Expert Group on Millennium Development Goal Indicators greater emphasis was placed on reproductive health care and family planning as integral to achieving Goal 5 to reduce maternal mortality. Achieving universal access to reproductive health care by 2015 was added as a new target towards Goal 5 and the contraceptive prevalence rate (CPR) and unmet need for family planning were introduced as indicators of progress towards this goal. While it can be argued that family planning underpins the attainment of all of the MDGs it has a particular significance in achieving Goal 4 to reduce child mortality, and Goal 3 to promote gender equality and empower women. As Cleland (2001:46) puts it 'by releasing women from the burden of frequent childbearing it paves the way for a revolution in gender relations'.

1.2: Background Context

1.2.1: Fertility Trends in Ghana

The current TFR in Ghana calculated for the three years preceding the 2003 Ghana Demographic Health Survey (GDHS) is 4.4 births per woman. This is relatively low in comparison to other sub-Saharan African countries many of which have an average of over 6 births per woman, as shown in Figure 1.1 below.

Figure 1.1: Total Fertility Rates aged 15-49 of Selected Sub-Saharan African Countries



Source Data: Central Bureau of Statistics [Kenya] et al, 2004; Central Statistical Agency [Ethiopia] & ORC Macro, 2006; Central Statistical Office [Zimbabwe] & Macro International Inc., 2007; Ghana Statistical Service et al, 2004; Institut National de la Statistique [Cameroon] & ORC Macro, 2004; Institut National de la Statistique et de la Démographie [Burkina faso] & ORC Macro, 2004; Institut National de la Statistique et de l'Analyse Économique [Benin] & ORC Macro, 2002; Ministry of Health and Social Services [Namibia], 2003; National Statistical Office [Malawi], & ORC Macro, 2005; Ouagadjio et al, 2004; Uganda Bureau of Statistics & Macro International Inc., 2007

Table 1.1 shows the change in TFR calculated from GDHS survey data from 1988, 1993, 1998 and most recently 2003. There has been a dramatic decline in fertility of 2 births per woman between 1988 and 1998, however the decline in fertility appears to have stalled between 1998 and 2003 and the TFR remains the same between these two surveys.

Trends in this data should be interpreted with some caution as they must be viewed within the context of the varying data quality and sample size of each of the four different surveys (Ghana Statistical Service, 2004).

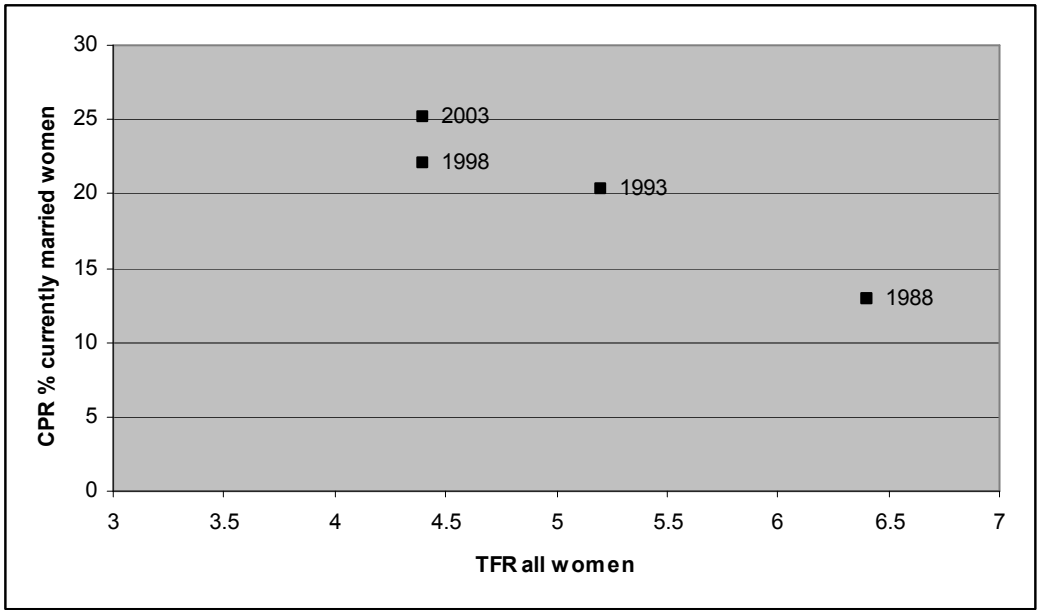
Table 1.1: Trends in Total Fertility Rates from GDHS, 1988-2003*

	GDHS 1988	GDHS 1993	GDHS 1998	GDHS 2003
TFR ages 15-49 years	6.4	5.2	4.4	4.4

* Rates are per 1,000 women and refer to the three-year period preceding the survey
Data Source: GDHS, 2003

This stall in fertility decline is evident despite the continued rise in the contraceptive prevalence rate (CPR) measured between these surveys. The relationship between the TFR and the CPR over the time of these four GDHS surveys is shown in figure 1.2 which shows both the continued rise in the CPR and the levelling off of the decline in the TFR.

Figure 1.2: Scatter Graph of Total Fertility Rate and Contraceptive Prevalence Rate from GDHS, 1988-2003



Data Source: GDHS, 2003

A study by Bongaarts (2005) explores the possible determinates of the fertility stall in Ghana along with six other countries where a similar stall has been identified. The study found that in Ghana there were no significant increases in unwanted fertility or the unmet need for

contraception and median age at first marriage rose while family planning effort scores improved slightly during the period between the 1998 and 2003 surveys. The study also looked at the socio-economic variables of GDP, child survival and proportion schooled and found that although changes in these variables had levelled off over the period in question this was not a significant factor in the fertility stall. Despite no significant link being found between socio-economic development and the stalling fertility the study did conclude that improvements in socio-economic development are needed in Ghana to further reduce wanted fertility which was 3.7 children per women at the time of the 2003 survey. The study also concluded that although the findings suggested no major deterioration in access to contraceptives, the level of unmet need is relatively high at 34% and improvements in access to family planning methods would therefore be desirable (Bongaarts, 2005).

Another interesting finding from this study is, that at the onset of the fertility stall the TFR in Ghana was already low compared to what would be expected based on the level of socio-economic development. There is no clear explanation for this finding but it is in line with a similar finding from a study by Blanc & Grey (2000) that the TFR calculated from the 1998 GDHS is lower than would be expected based on the CPR at that time. Based on a regression line, calculated using data from 100 surveys in developing countries, the expected TFR predicted for Ghana in 1998 would be 5.75 while the actual recorded fertility according to the GDHS of that year is 4.6[1] (Blanc & Grey, 2000). The study explored the possible reasons for this finding and concluded that there had been a number of changes in contraceptive dynamics prior to 1998 that could increase the effect of contraceptive prevalence on fertility reduction. These include a marked shift from traditional methods to modern methods, a reallocation from the use of contraception for birth spacing towards the use of contraception for the limitation of births and a substantial reduction in

[1] This figure differs from the TFR of 4.4 reported by the GDHS and presented in table 1.1 because the GDHS calculate the TFR based on births from the 3 years preceding the 1998 GDHS survey whereas the Blanc & Grey study based their TFR on births from the 5 years preceding the survey.

"redundant" use (Blanc & Grey, 2000). Another suggestion put forward by Agyei-Mensah (2005) is that the stall is related to fertility desires and that a drop below four children represents a significant psychological barrier for couples which will require 'a more radical transformation of the society' (Agyei-Mensah, 2005:16). As evidence of this the study points to a stall in the decline of the ideal number of children which coincides with the stall in TFR and is shown in table1.2 below.

Table 1.2: Mean Ideal Number of Children (all women aged 15-49 years), GDHS 1988-2003

	GDHS 1988	**GDHS 1993**	**GDHS 1998**	**GDHS 2003**
Mean ideal number of children	5.3	4.4	4.3	4.4

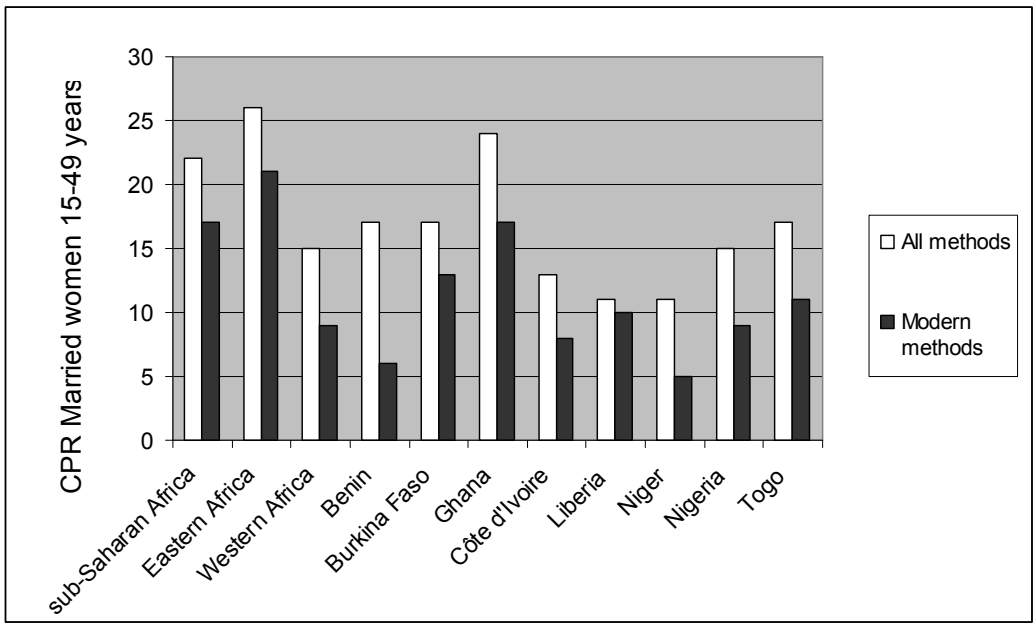
Data source: Ghana Statistical Service & Institute for Resource Development/Macro Systems, Inc., 1989; Ghana Statistical Service (GSS) and Macro International Inc., 1994; Ghana Statistical Service (GSS) and Macro International Inc. 1999 & Ghana Statistical Service et al, 2004)

Overall these studies do not offer an obvious explanation of the fertility stall in Ghana or provide a clear prediction of what the future fertility trends may be. The suggestion is that the stall is a temporary adjustment based on the fact that prior to stalling the TFR was already lower than would be expected given other determinants. In essence that fertility has stalled while CPR and levels of socio-economic development continue to rise and in effect 'catch up' to the fertility level. If this theory is correct it would follow that once the 'catch up' is complete then fertility will continue to decline towards replacement level. The idea that fertility in Ghana should continue to decline and reach replacement level is based on classical demographic transition theory and the past experience of European countries. The applicability of this theory to sub-Saharan African countries is questionable and the lowest fertility level which will be achieved at the end of the transition in Ghana is unknown.

1.2.2: Contraceptive Use in Ghana

According to the GDHS 2003 knowledge of contraceptive methods in Ghana is almost universal with 97.7% of all women and 98.9% of all men aged 15-49 years reporting knowledge of at least one method. Among women modern methods are more widely known than traditional. The overall CPR for all women aged 15-49 years in 2003 is 20.7%. As would be expected the CPR for married women is higher than for all women and in 2003 was 25.2% for any method (Ghana Statistical Service et al, 2004). In the global context this is relatively low, for example the corresponding figure in 2009 in the UK for currently married women is 84% and the world average is 62% (Population Reference Bureau, 2009). However figure 1.3 shows the CPR of selected countries and regional averages in sub-Saharan Africa, and shows that within this regional context the CPR in Ghana is actually quite high.

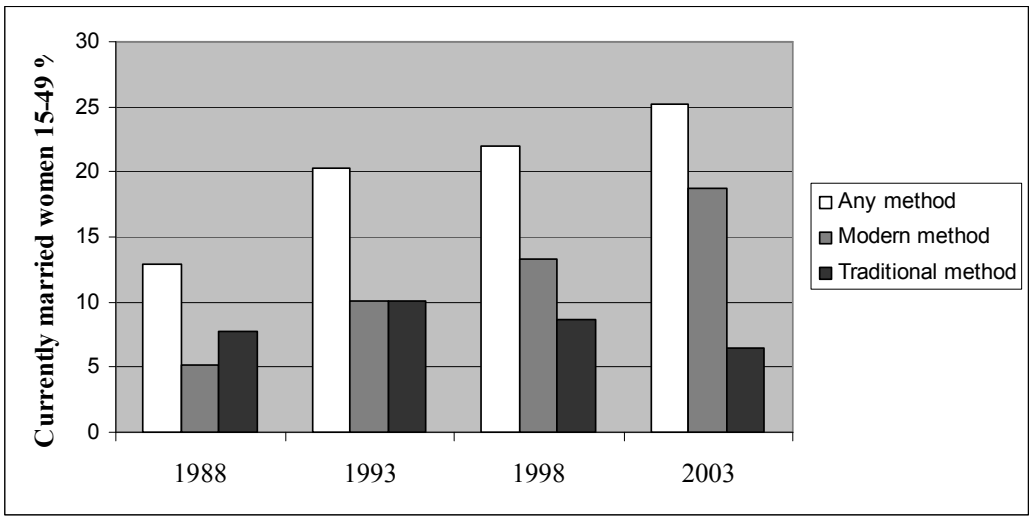
Figure 1.3: Contraceptive Prevalence Rates of Selected Sub-Saharan African Countries and Regions (currently married women aged 15-49 years)



Source data: Population Reference Bureau (2009)

Figure 1.3 shows that Ghana has an all method CPR higher than any other country in West Africa and higher than the average for all of sub-Saharan Africa. The modern methods CPR is the same as the average for all of sub-Saharan Africa and is only lower than the Eastern Africa regional average. Figure 1.4 is based on GDHS data and shows the trends in contraceptive use for married women aged 15-49 by modern, traditional and any method from 1988 to 2003. The graph shows a steady increase in the prevalence of modern methods accompanied by a decline in the percentage reporting use of a traditional method since 1993. Despite the increases in the use of modern methods shown, the CPR of modern methods remains below 20% in 2003 which makes the previously stated goal of the GPRS Vision 2020 to have a modern methods CPR of 50% by 2020 seem a difficult target to attain.

Figure 1.4: Trends in Contraceptive Use among Currently Married Women Aged 15-49 years from 1988 to 2003 (%)



Data Source: Ghana Statistical Service et al, 2004

1.2.3: Reasons for Non-use of Contraception in Ghana

1.2.3.1: Current Non-Use

Many previous studies have used DHS data to determine the socio-economic and cultural characteristics which may act as determinants of individuals' contraceptive behaviour and in doing so have identified

several barriers to contraceptive use. Studies in Ghana have shown that rural residence, illiteracy, low levels of education and lack of exposure to media sources all act as barriers to the use of modern contraceptives (Parr, 2001). Many DHS provide data on the non-use of contraceptives in which respondents are asked the question: 'You have said that you do not want (a/another child soon) (any more children), but you are not using any method to avoid pregnancy. Can you tell me why?' (Ghana Statistical Service et al, 2004). Respondents are allowed to answer more than one reason and their responses are then field coded in to the 21 categories which appear in table 1.3 below. Table 1.3 shows the number and percentage of respondents citing each reason for non-use in the GDHS 2003.

Table 1.3: Reason for Current Non-use of Contraception GDHS 2003

Reason for non-use	**Frequency N = 2328**	**Percent**
Not married	332	14.3
Not having sex	653	28.0
Infrequent sex	206	8.8
Menopausal/hysterectomy	98	4.2
Subfecund/infecund	47	2.0
Postpartum amenorrheic	124	5.3
Breastfeeding	302	13.0
Fatalistic	3	0.1
Respondent opposed	41	1.8
Husband/partner opposed	47	2.0
Religious prohibition	34	1.5
Knows no method	141	6.1
Knows no source	106	4.5
Health concerns	127	5.4
Fear of side effects	384	16.5
Lack of access/too far	74	3.2
Costs too much	133	5.7
Inconvenient to use	20	0.9
Interferes with body's processes	32	1.4
Other	84	3.6
Don't know	59	2.5

* Percentages do not add up to 100 as respondents are allowed to answer in more than one category.

Table 1.3 shows that the most commonly cited reason for non-use is not having sex which is mentioned by 28% of respondents, the next most frequency cited reason is fear of side effects followed by being unmarried.

Lack of knowledge, lack of access and opposition to family planning in general are not frequently cited reasons for non-use.

1.2.3.2: Future Intentions for Non-Use

Along with being asked their reason for not currently using a contraceptive method respondents in DHS are also asked if they intend to use a contraceptive method in the future. If the answer is 'no' then those respondents are asked the follow up question: 'What is the main reason that you think you will not use a contraceptive method at any time in the future?' (Ghana Statistical Service et al, 2004). The responses are grouped into five main categories and the percentage distribution of respondents in each category from the GDHS 2003 is shown in figure 1.5 below.

Figure 1.5: Percentage Distribution of Currently Married Women aged 15-49 by Main Reason for Not Intending to Use Contraception in the Future GDHS, 2003 (N = 1102)

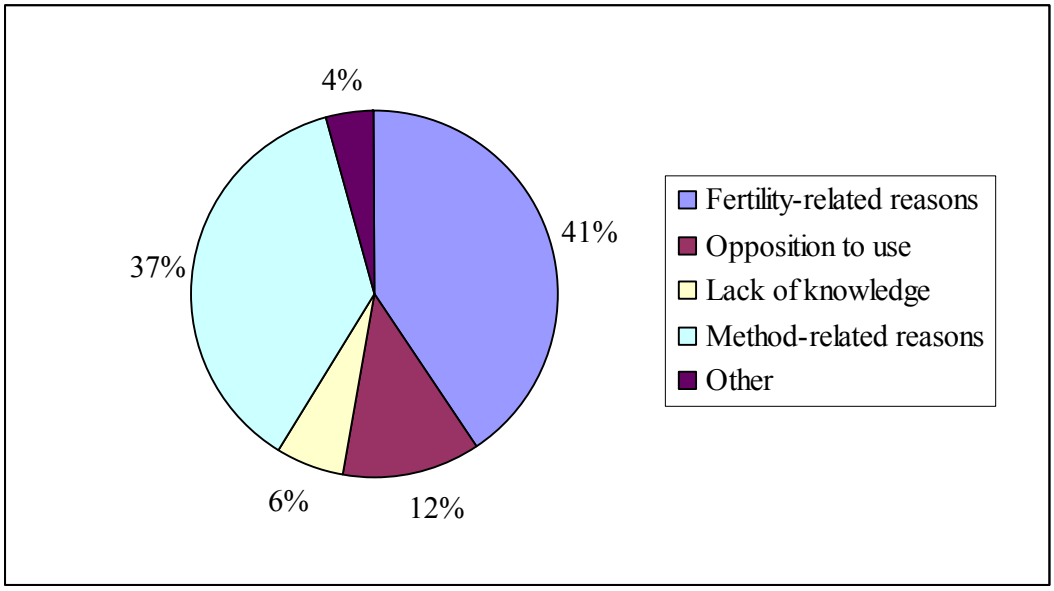


Figure 1.5 shows that as would be expected 'fertility related reasons' is the most commonly cited category of responses with 40.5% of respondents citing one of these as their main reason for not intending to use a contraceptive method in the future. Fertility related reasons comprise those whose main reason is 'subfecund/infecund' or 'wants as many children as possible' each of which account for approximately 15% of all

responses. The remaining two fertility related reasons are 'menopausal/had hysterectomy' and 'infrequent sex/no sex' each with approximately 5% of all responses. The category of 'method related reasons' is the second most commonly cited category of reasons with 37.3% of respondents citing one of these as their main reason for not intending to use FP in the future. The remaining categories are 'opposition to use', 'lack of knowledge' and 'other' comprising 12.3%, 5.7% and 4.2% of responses respectively.[2] The category of primary interest to this study is 'method related reasons' and figure 1.6 below shows this category broken down into its six individual response categories.

Figure 1.6: Percentage Distribution of Currently Married Women aged 15-49 by Main Reason for Not Intending to Use Contraception in the Future – Method Related Reasons GDHS, 2003 (N = 408)

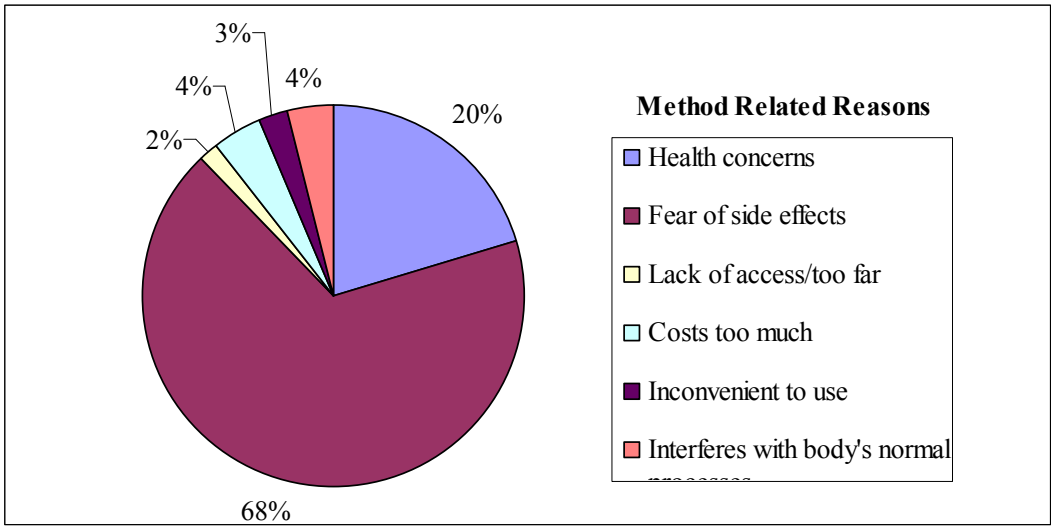


Figure 1.6 shows that 'fear of side effects' dominates 'method related reasons' with 68% of all responses. This translated to 25.6% of all respondents citing fear of side effects as their main reason for intention not to use family planning which is by far the most often cited reason. 'Health concerns' accounts for a further 20% of method related reasons or

[2] These three categories are comprised of the following individual responses:
Opposition to use: Respondent opposed, Husband/partner opposed, Religious prohibition.
Lack of knowledge: Knows no method, Knows no source
Other: Other, Don't know, Missing

7.6% of all reasons, and the four remaining categories each account for a small percentage of responses.

1.2.4: Clinical Evidence of Side Effects

As shown above fear of side effects is a frequently cited reason for the non-use of modern contraceptives. One of the aims of this study is to attempt to gain a better understanding of the term 'fear of side effects' and of what women are actually experiencing when they refer to side effects. There is a large body of evidence based on clinical trials which details the possible physical symptoms and side effects which may be caused by using a particular contraceptive method (see for example Kubba et al., 2000). Table 1.4 shows a summary of the side effects which are associated with each different hormonal methods and IUDs, which is compiled from the WHO family planning providers' handbook. Table 1.4 shows that all methods are associated with menstrual changes and hormonal methods are most often associated with headaches and dizziness. There is also evidence to show that there is a small risk of more serious side effects such as deep vein thrombosis, pulmonary embolism or stroke, however these are all very rare. Connections have also been made between some types of hormonal contraceptives and increased risk of certain cancers particularly breast and cervical cancer. There are also instances where contraceptive method use can have a protective effect against certain types of cancer, as shown in table 1.5. There are obvious health benefits of contraceptive use in terms of avoiding unwanted pregnancies and the associated risks of child birth or induced abortion, however looking beyond this there are other potential protective or beneficial effects of methods which are summarized in table 1.5. Of particular relevance in the sub-Saharan African context is the possible protecting against iron-deficiency anaemia provided by many methods.

Table 1.4: Possible Side Effects of Modern Methods

	Combined Oral contraceptive	Progestin-only pills	Progestin-only injectables	Combined injectables	Implants	Copper bearing IUD	Levonorgestrel IUD
Possible Side Effects							
Changes in bleeding pattern	✓	✓	✓	✓	✓	✓	✓
Headache	✓	✓	✓	✓	✓		✓
Dizziness	✓	✓	✓	✓	✓		✓
Nausea	✓	✓			✓		✓
Breast tenderness	✓	✓		✓	✓		✓
Weight change	✓		✓	✓	✓		✓
Mood changes	✓	✓	✓		✓		✓
Acne (Usually improves)	✓				✓		✓
Abdominal pain/bloating		✓	✓		✓		
Lower sex drive			✓				
Cramps and pain during monthly bleeding						✓	
Other Possible Physical Changes							
Increase in blood pressure	✓						
Loss of bone density			✓				
Enlarged ovarian follicles					✓		
Ovarian cysts							✓

Source: CCP & WHO (2007)

Table 1.5: Health Benefits of Modern Methods

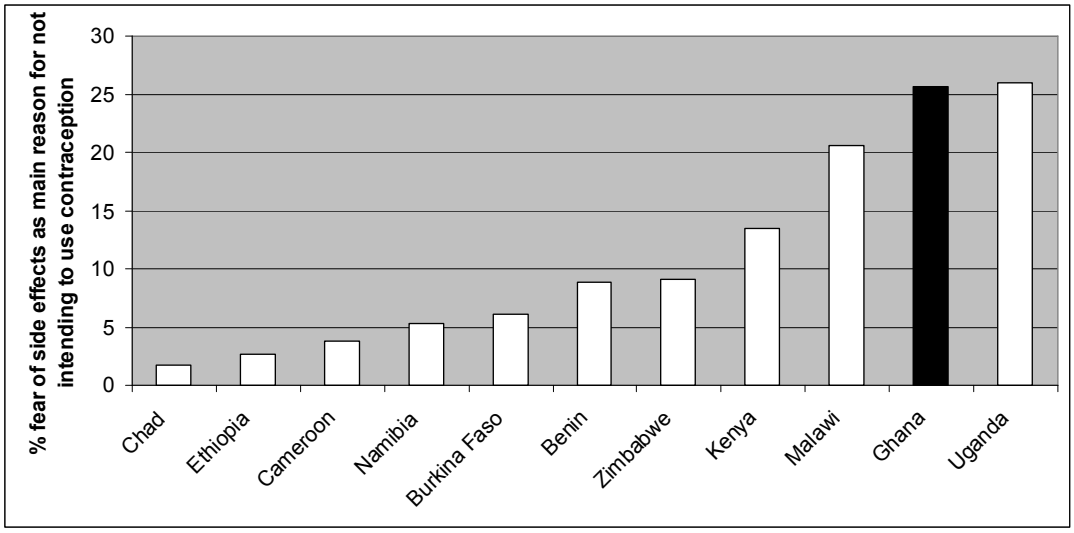
	Combined Oral contraceptive	Progestin-only pills	Progestin-only injectables	Combined injectables	Implants	Copper bearing IUD	Levonorgestrel IUD
Known health benefits: ✓✓ = helps protect against ✓ = may help protect against							
Endometrial cancer	✓✓		✓✓			✓	
Cancer of the ovary	✓✓						
Symptomatic pelvic inflammatory disease	✓✓		✓		✓✓		
Uterine fibroids			✓✓				
Iron-deficiency anaemia	✓		✓		✓		✓✓
Ovarian cysts	✓						
Pelvic inflammatory disease							✓
Reduces:							
Symptoms of endometriosis	✓		✓				✓
Sickle cell crises among women with sickle cell anaemia			✓				
Menstrual cramps/bleeding problems	✓						✓
Ovulation pain	✓						
Excess hair on face or body	✓						
Symptoms of polycystic ovarian syndrome	✓						

Source: CCP & WHO (2007)

1.2.5: Fear of Side Effects in Ghana

Overall fear of side effects is 25.6% of women's main reason for not intending to use contraception and is by far the most commonly cited single reason why women say they do not intend to use contraception in the future. Fear of side effects has also increased in importance as a reason for non-use between 1998 and 2003, from 18% to 26%. Fear of side effects is more likely to be cited as the main reason for not intending to use in the future by younger women with 34.2% of those in the age range 15-29 years citing this reason compared to 22.5% in the age range 30-49 years. Figure 1.7 shows that compared to other sub-Saharan African countries Ghana has a high level of fear of side effects with only Uganda being slightly higher at 26%.

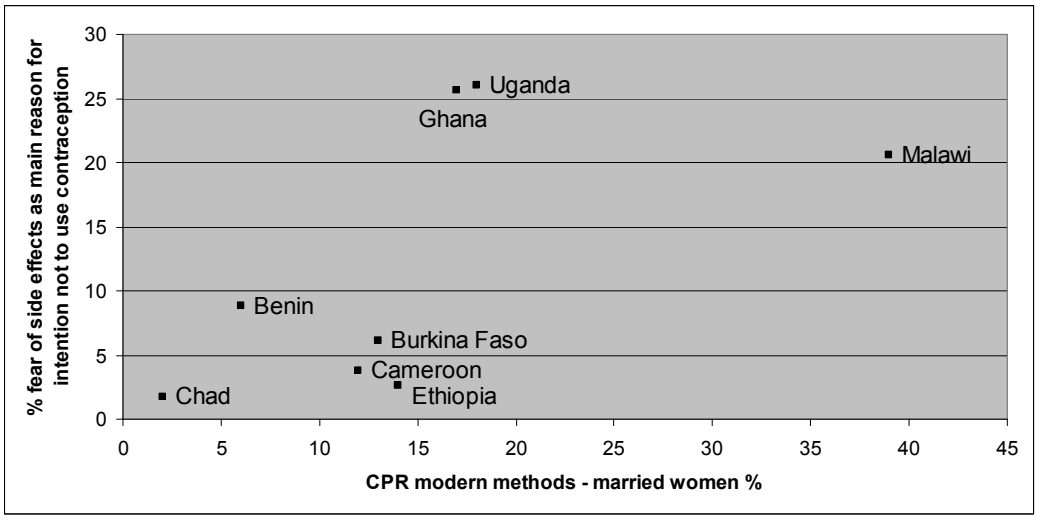
Figure 1.7: Percentage of Respondents Citing Fear of Side Effects as Main Reason for Not Intending to Use a Contraceptive Method in the Future Selected sub-Saharan Countries



Source Data: Central Bureau of Statistics [Kenya] et al, 2004; Central Statistical Agency [Ethiopia] & ORC Macro, 2006; Central Statistical Office [Zimbabwe] & Macro International Inc., 2007; Ghana Statistical Service et al, 2004; Institut National de la Statistique [Cameroon] & ORC Macro, 2004; Institut National de la Statistique et de la Démographie [Burkina faso] & ORC Macro, 2004; Institut National de la Statistique et de l'Analyse Économique [Benin] & ORC Macro, 2002; Ministry of Health and Social Services [Namibia], 2003; National Statistical Office [Malawi], & ORC Macro, 2005; Ouagadjio et al, 2004; Uganda Bureau of Statistics & Macro International Inc., 2007

Figure 1.8 shows the correlation between the percentage of respondents who cite fear of side effects as their main reason for not intending to use a method in the future and the CPR of modern methods. The data is taken from the most recent DHS survey from each country. The graph shows that there is a positive correlation between the two variables and generally the percentage of respondents citing fear of side effects goes up as the modern method prevalence goes up. The correlation coefficient for the relationship between the two variables is 0.60. Clearly Uganda and Ghana both have an unusually high prevalence of fear of side effects compared to their modern method CPR when compared to the other countries shown in figure 1.8.

Figure 1.8: Plot of Percentage of Respondents Citing Fear of Side Effects as Main Reason for Not Intending to Use a Contraceptive Method in the Future by CPR modern methods



Source Data: Central Statistical Agency [Ethiopia] & ORC Macro, 2006; & Macro International Inc., 2007; Ghana Statistical Service et al, 2004; Institut National de la Statistique [Cameroon] & ORC Macro, 2004; Institut National de la Statistique et de la Démographie [Burkina faso] & ORC Macro, 2004; Institut National de la Statistique et de l'Analyse Économique [Benin] & ORC Macro, 2002; National Statistical Office [Malawi], & ORC Macro, 2005; Ouagadjio et al, 2004; Uganda Bureau of Statistics & Macro International Inc., 2007

1.2.5.1: Method Mix

Clearly when exploring the issue of side effects some methods are less relevant than others due to their lack of related side effects. Traditional methods are not a focus in this study as they have few clinical symptoms, and are not often associated with other side effects, although there may of

course be socio-cultural implications in their use. Due to the differential effects of each method the overall experience of side effects in a population of contraceptive users will depend heavily on the method mix. Table 1.6 shows the distribution of current users by specific method in Ghana based on data from the GDHS 2003.

Table 1.6: Distribution of Current Contraceptive Users by Method, GDHS 2003

Method	Frequency	Percent*
Pill	218	19.0
IUD	32	2.8
Injections	226	20.0
Diaphragm[3]	3	0.3
Condom	220	19.0
Female Sterilization	66	5.8
Periodic Abstinence	232	20.0
Withdrawal	42	3.7
Other[4]	30	2.6
Norplant	45	3.9
Lactational amenorrhea (LAM)	13	1.1
Female condom	7	0.6
Foam or jelly	12	1.0
Total	1146	99.8

* does not add to 100 due to rounding

Table 1.6 shows that the most frequently used methods which are associated with potential clinical side effects are injectables and the pill with 20% and 19% of current users respectively. These two methods along with periodic abstinence with 20% of users and condom with 19% account for 78% of all current use. All methods associated with clinical side effects combined account for 51.5% of all current use.

[3] At the time of the 2003 GDHS the diaphragm was no longer available in Ghana
[4] This category consists of users of folkloric methods, an ill-defined and context specific categorization concerned with methods of unknown efficacy. For the purposes of this study these respondents could be considered non-users however they cannot be included in the sample for analysis as they were not asked the relevant questions asked of non-users.

1.2.5.2: Experience of Side Effects

In this study a distinction is made between the concept of 'fear of side effects' and the actual experience of side effects by current or past method users. The GDHS collects information on fear of side effects among current non-users, which has been presented above, and also asks current users of the pill whether or not they have experienced a range of side effects during the current episode of use of the method. Table 1.7 presents the answers to this question which is asked as a yes/no question for each individual side effect listed in the table. Current users of other methods besides the pill are not asked questions about their experience of side effects.

Table 1.7: Side Effects Experienced by Current Users of the Pill, GDHS 2003

Side Effects From Pill N=218*	Frequency	Percent
Dizziness		
Yes	15	6.9
No	201	93.1
Weight gain		
Yes	3	1.4
No	213	98.6
Headaches		
Yes	10	4.6
No	206	95.4
Excessive bleeding		
Yes	5	2.3
No	211	97.7
Irregular cycle		
Yes	18	8.3
No	198	91.7
Painful period/cramps		
Yes	3	1.4
No	213	98.6
Palpitations		
Yes	12	5.6
No	204	94.4
Other		
Yes	6	2.8
No	210	96.3
No side effects		
Yes	162	75.0
No	54	25.0

* For all variables in this table 2 cases (0.9% of data) are missing

Table 1.7 shows that the majority of pill users (75%) have not experienced any side effects at all. The most commonly mentioned side effects are irregular cycle and dizziness mentioned by 8.3% and 6.9% of current users respectively.

1.3: Aims of Study

The aim of this thesis is to shed light on an under researched topic about which little detail is currently known. Many studies make mention of the issue of side effects but invariably it is a secondary theme in studies ultimately focused on another topic. Due to the frequency with which the problem of side effects arises research into this area specifically is needed. This thesis will explore the topics of side effects from all possible perspectives and will present three papers each uniquely addressing the issue of side effects by using three different sources of data and three different corresponding methods. Each paper is addressing the same topic and within the same theoretical framework however the disparate nature of the data sources and techniques used provides each paper with its own distinctive perspective on the research questions. Each paper stands alone as a sufficient body of knowledge and each method contributes something unique towards an understanding of the phenomena under study (Morgan, 1997). Additionally the combining of these very different methods in the thesis as a whole creates the ability to make larger connections within the results which according to Bryman (1988: 21) is highly desirable.

1.3.1: Research Questions

Each paper has specific research questions associated with it determined by the nature of the data and method but the overall research questions addressed are:

- In what way do side effects and the fear of side effects influence contraceptive behaviour and function as a barrier to the use of modern or hormonal methods among women in Ghana?
- Is the fear of side effects and subsequent contraceptive behaviour influenced by exposure to different sources of family planning information?

The first paper is an in-depth look at the issues of side effects using a qualitative approach to explore individuals' perceptions, attitudes and experiences. This paper goes beyond the limited range of responses provided by survey data, and looks at how the individual women concerned understand the issue of side effects and fear of side effects. The particular method employed in the data collection is focus group discussions which are used to gather substantive information while also providing insight into group dynamics and the nature of informal social interaction (Avogo & Debpuur, 2005). The study will focus on the communication of information about family planning, in this case interpersonal communication passed from woman to woman within an informal social network, as the primary explanatory factor in understanding fear of side effects.

The second paper broadens the focus slightly and uses calendar data from a longitudinal data set collected in three regions in Southern Ghana. This paper uses monthly data on contraceptive use and the experience of side effects over a five year period to explore the effect of experiencing side effects on contraceptive discontinuation. The methodology employed is a multi-level logistic discrete-time hazards model which allows for the inclusion of socio-economic background variables and time varying covariates. The main explanatory variables in this study are measures of communication about family planning and whether users were encouraged or discouraged to use family planning.

The third paper uses the nationally representative 2003 GDHS data and logistic regression analysis examine the association between exposure to family planning information, through mass media and interpersonal channels, and the probability that a respondent will cite fear of side effects as their main reason for not intending to use a contraceptive method in the future. This paper also looks at the socio-economic and demographic characteristics of those who cite fear of side effects as their main reason for not intending to use contraception in the future. The method allows the determination of which explanatory variables are

significant determinants of fear of side effects, along with a quantification of the direction and magnitude of any associations, while controlling for any possible confounding factors.

1.3.2: Limitations

There are specific limitations associated with each of the three papers in this study which occur by virtue of the nature of the data or the methods of analysis. The first paper uses a qualitative methodology which overcomes the lack of depth and detail which limit quantitative data sources but in common with all qualitative studies lacks representativeness and comparability. The second paper is based on longitudinal data which allows for the temporal placing of events but is on a relatively small scale and cannot be said to be representative beyond the six study communities sampled. The final paper is based on GDHS data which is a nationally representative sample but suffers from the fact that it is a cross sectional survey and therefore the timing of events cannot be ascertained and no causal connections can be established. Each data source carries limitations of its own, but also makes up for the limitations of another so overall these limitations are not detrimental to the study because each angle is explored by a different paper.

Another potential limitation of this study is that it does not consider men in any of the analysis. Obviously men have an extremely important and influential role in all reproductive and contraceptive behaviour. It was felt for a number of reasons however that within the scope of this study it is really women's experiences and perceptions which speak to this issue. Side effects are mostly applicable to hormonal or inter-uterine methods so only women actually experience their use and directly experience their consequences (Hardon, 2002). Many of the secondary and social effects of contraceptive use feature men directly but it is really women's perception of male involvement that is the focus of this study. Other authors have been questioning of program efforts and research which replaces the individual with the marital couple as the decision making

unit. They believe that although men may influence couple reproductive decisions, 'spouses should not be assumed to act together as a decision making unit' (Biddlecom & Fapohunda, 1998: 360).

Studies do show that spousal communication about family planning is an important factor (Tesfayi & Mishra, 2007) in predicting method use; however information on spousal communication can be gained from the women only. In this study unmarried women are included in paper one and therefore husbands characteristics could not be included and in paper two, although only married women are in the data set, for reasons of data quality and availability husbands characteristics were not included. It is not felt that this is a serious limitation given that previous studies in Ghana looking at contraceptive use have found that partners' characteristics are not a significant predictor of contraceptive use (Oheneba & Takyi, 1997; Tawiah, 1997). The limitations specific to each paper are further discussed in each of the introduction sections.

1.3.3: Structure of Thesis

This thesis is presented in six chapters which are briefly described here. The first chapter of the thesis has introduced the topic and has provided the relevant background data and rationale behind the study. Contextual information on current contraceptive use and fertility dynamics in Ghana and the overall aims of the study have been outlined. The second chapter establishes the theoretical framework, of diffusion of innovation theory, which is common to all three papers and briefly reviews some of the relevant literature. Each of the next three chapters presents the three individual papers in turn. Each is presented in five sections beginning with an introduction to the specific topic including research questions and aims of the paper. This is followed in each case by reviews of relevant previous studies and then a section on data and methods. Results are then presented and each chapter ends with some discussion of the results and conclusions and policy implications which can be drawn. Ultimately the thesis is concluded in chapter six by a discussion and conclusion of

the results of the study as a whole, along with policy implications and suggestions for further study. A summary of the three papers and their associated data and methods is provided in table 1.8 below.

Table 1.8: Summary of Three Papers

Chapter	**3**	**4**	**5**
Data	Qualitative data from primary data collection	Longitudinal survey data 7-rounds of data 1998-2003	2003 GDHS
Method	Focus group discussions	Multi-level logistic discrete-time hazards model	Logistic regression analysis
Study Area	2 of the previous 6 locations in Southern Ghana	6 locations in 3 regions in Southern Ghana	Nationally representative survey
Population of Interest	All women aged 15-49 resident in one of the two study locations and who have at least some prior knowledge of family planning	All women aged 15-49	All women aged 15-49
Sample	55 convenience sampled focus group participants (Plus interviews with 10 purposively selected opinion leaders and service providers)	732 episodes of contraceptive use contributed by 476 individuals	1330 women who are current non-users and who state that they do not intend to use a contraceptive method in the future

Chapter Two

Theoretical Framework

Since the 1960s many developing countries have implemented family planning programmes as a key element in population policies aimed at regulating fertility. The impetus for these policies is concern over the effects of rapid population growth, which threatens to undermine improvement in standards of living and health care which in turn allows persistently high fertility levels, creating a negative feedback loop (Bongaarts et al, 1990). Overall fertility in developing countries has been declining since the late 1960s but there has been significant regional and country level variation. In Sub-Saharan Africa fertility declines have been particularly small. Fertility declines are largely attributable to the spread of contraception and data collected over several decades shows evidence of a strong correlation at national level between contraceptive use and fertility (Blanc & Grey, 2000; Bongaarts et al, 1990). There is however some debate over the ability of family planning programs to influence fertility preferences (Freedman, 1997) and numerous studies have tried to quantify the contribution of family planning programs to fertility decline but for various reasons have come to highly varying estimates (Bongaarts et al, 1990).

Traditional theories of fertility decline, including Notestein's (1945) Demographic Transition Theory, Easterlin (1975) and Caldwells (1982) cost-benefit models of individual fertility decision-making, focus on underlying socio-economic development as the driving force of fertility change and contraceptive use as the primary means through which it is achieved. The demographic transition theory commonly attributed to Notestein (1945) has proved the most influential theory of fertility change. The theory postulates that in pre-transitional society's, fertility and mortality are high and there is little or no use of contraception to restrict fertility. Over time societies undergo a process of 'modernization' with

associated changes in urbanization, modes of production and improvements in socio-economic development. Better health care, sanitation and nutrition lead to a declining mortality rate, fertility remains at a level high enough to permit survival in an earlier period and a period of rapid population growth results (Notestein, 1945). Throughout this transition period desired family size begins to decline in response to the new socio-economic conditions and fertility declines primarily through 'rational control, largely by means of contraceptive practices' (Notestein, 1945: 40). At the end of the transition mortality remains low, fertility is at or below replacement level and some form of fertility control is practiced by the majority.

The core of the demographic transition theory is that macro-economic change and the development of industry acts as the driving force of fertility change. However the mechanisms through which this is achieved are not specified in the theory. Classic transition theory has also been criticized for its lack of attention to cultural influences on fertility (Kirk, 1996). Subsequent theories have attempted, to a greater or lesser degree, to integrate social, economic and cultural factors. Micro-economic theories apply the theory of consumer behaviour to the analysis of fertility, where children are seen as a special kind of consumer good. Demand theories, such as the theory of 'household choice' or 'new home economics' first proposed by Becker in 1960, focus on changes in the economic costs and benefits of children which reduces demand for children and drives fertility change. Easterlin's (1975) 'supply and demand' theory, and a subsequent variation put forward by Bongaarts in 1993, expands on previous micro-economic theories by explicitly taking into account variables related to the supply of children. The 'supply-demand' theory suggests that the three central elements, supply of children, demand for children, and the cost of fertility regulation, are the mechanisms through which socio-economic developments operate to influence fertility and its proximate determinants (Bongaarts, 1993). Also, in an attempt to encompass the views of non-economists, Easterlin's

framework includes subjective variables, such as preferences and attitudes, in the costs of fertility regulation (Easterlin, 1975).

Caldwell's (1982) 'wealth flow theory' of fertility decline focuses on the direction and magnitude of inter-generational flows of 'money, goods, services and guarantees that one person provides to another' (Caldwell, 1982: 333). In contrast to previous theories Caldwell argues that high fertility in pre-transitional societies does represent economically rational behaviour and he further points out that the goals of family life may not necessarily be to maximize the economic position of the nuclear family. In this theory all economic transitions are ultimately seen to serve social ends and so the nature of the goals of the family will depend on their particular socio-cultural context. In pre-transitional societies the flow of wealth is from children to parents making high fertility advantageous. Over time changes in the mode of production and processes of modernization, particularly mass education, cause families to transit to a more nuclear structure and become more egalitarian. As such the cost of children increases and the situation is reversed with wealth flowing from parent to child and high fertility is no longer economically rational. Although these theories may attempt to include the influence of cultural factors on fertility change they all fundamentally stress changes in socio-economic variables as the driving force of fertility decline.

Cleland and Wilson (1987) argue that micro-economic theories of fertility change are implausible and incomplete and structural change, while undoubtedly playing a role, is not sufficient to explain observed fertility trends. The demographic transition theory is both highly generalized and Euro-centric and for a variety of reasons its applicability to demographic change in contemporary developing countries has long been in question. For example, the pace and source of mortality decline in developing countries is different from the European experience due to the importing of medical technologies which may reduce mortality regardless of the level of development (Teitelbaum, 1975). Caldwell suggests that the fertility transition in developing countries is not only influenced by

'modernization' and associated structural changes but also by a process of 'westernization' which has imported Western ideology and concepts of the family (Caldwell, 1982).

In addition to this the ability of the demographic transition theory to fully explain the European fertility decline is also questionable. From 1963 until 1986 Ansley Coale led the Princeton European Fertility Study which was an attempt to empirically test the demographic transition theory using provincial level data on European fertility from 1870 to 1960 (Coale & Watkins, 1986). One of the key findings of this study was that once fertility in a region of a country had begun to decline, neighbouring regions with the same language or culture followed after short delays, even when they were less developed. The findings suggest that the effects of modernization are not confined only to those who adopt a new behaviour but also alter the social context for those who do not. This and a number of other unexplained patterns of reproductive change led to the proposal that the diffusion of information about family planning is an important mechanism for fertility change (Bongaarts & Watkins, 1996). In settings in which fertility has been high innovation takes the form of contraceptive adoption and fertility limitation.

Diffusion of innovation theory states that new ideas and behaviours can be spread through a network of people by various channels of communication and comprises four main elements (Rogers, 1983):

1) **An innovation:** an innovation is an idea, practice or object that is perceived as new by an individual.
2) **Communication through certain channels:** Diffusion is a particular type of communication in which the information that is exchanged is concerned with new ideas. In essence information exchange by one individual communicates a new idea to one or several others. 'A communication channel is the means by which messages get from one individual to another. The nature of the information exchange relationship between a pair of individuals

determines the conditions under which a source will, or will not, transmit the innovation to the receiver' (Rogers, 1983:17). Different types of communication channel allow different styles of communication. For example mass media enables one or a few individuals to reach a large audience whereas interpersonal channels involve a face-to-face exchange between two or more individuals

3) **Time:** The innovation needs time to diffuse from one individual to the next and each individual's resulting attitude or behaviour change happens as a process over time. This has implications for the kind of data required to capture the diffusion process and 'the inclusion of time as a variable in diffusion research is one of its' strengths' (Rogers, 1983:20).
4) **A social system:** In order for people to exert social influence over each other the diffusion of innovations requires a social system that provides structure and norms of behaviour.

In the process of adopting a new innovation individuals embark on a decision making process in which they weigh up the costs and benefits associated with adoption as well as information or ignorance about outcomes and alternatives. As more individuals adopt an innovation an endogenous feedback process begins and as the process advances the uncertainty associated with the innovation is reduced. The outcomes of others' adoption become observable to those in the community who have not yet adopted the innovation and their resistance is diminished as their information about the potential risks and benefits is enriched (Palloni, 2001). As the innovation becomes more common so the social influence of peer groups accelerates the incidence of adoption (Cleland, 2001).

Diffusion of innovation theory does not reject the traditional idea that fertility and contraceptive use are a result of socio-economic determinants; rather it seeks to incorporate diffusion variables into the socio-economic model. The central argument is that diffusion dynamics are one mechanism through which the fundamental factors of social,

cultural and economic situation operate on an individual's decision making. 'Diffusion dynamics condition and mediate the effects of other variables either dampening or amplifying the effects' (Montgomery et al., 2001: 25). Therefore diffusion attempts to explain how a cascading mechanism can result in some individuals adopting a new behaviour despite the fact that their resources or social position remain the same. The adoption of new behaviour therefore 'occurs as a result of the re-evaluation of one's own choices in light of other people's behaviour, not as a strategic response or accommodation to a realignment of resources' (Palloni, 2001: 68). The dynamics of diffusion can take the form of cascade, contagion and tipping point phenomena. Based on the work of Casterline & Montgomery (1996) and Montgomery, Casterline & Heiland, (2001) two theories of the mechanism through which diffusion processes operate have been identified, social learning and social influence.

Social learning is the concept that individuals can gain information relevant to their own decision making process from others in their social network. Where modern contraceptive use is still new social learning may help to establish the properties of contraceptive methods themselves, for example their efficacy, monetary or social costs or potential side effects. Social learning can take place interpersonally through the observation of one actor by another or by the inference of attitudes from observed behaviour or through an individual's commentary and discussions about the innovation. Social learning can also take place impersonally when information is gained through mass media. Social learning encompasses both the acquisition of information and the filtering of information into terms that are meaningful to an individual's decision making. 'The concept of social learning is pertinent to environments that are characterized by flux and uncertainty, in which choice options are coming to the fore with associated costs and benefits yet to be fully understood' (Montgomery et al., 2001: 2). Social learning is an important concept in the evaluation of family planning programs as there is a spill over effect whereby the behaviour of one user can affect the motivations of another person who does not necessarily have any direct contact with the

programme. This spill over effect termed 'informational externality' can be either positive or negative in character and can therefore have either an amplifying or a restraining effect on the family planning program efforts.

Social influence refers to the power of pressure towards social conformity in groups. Hierarchical and power based influences can be interpreted as additional constraints on an individual's behaviour (Montgomery et al., 2001:5). There is no assumption that social influence must reinforce innovation and particularly where contraceptive use is low it may be seen as a significant barrier to adoption. Based on physiological literature it is suggested that negative information is often given disproportionate weight in the formation of perceptions and the evaluation of risks. As Montgomery et al. (2001:6) put it 'one gets the impression from research in developing countries that conversation about modern contraception is far more often negative than positive, with stories about extreme health repercussions of contraceptives often dominating the discussion.' The same authors also go on to use dynamic situation models which reflect differences in network composition and the content of the information passed to show that these factors can contribute to a convergence of opinion in a population on the costs of contraceptive use. If this is the case then over time negative views about contraception can come to dominate in the population.

As the use of modern contraceptives remains low in Ghana this study is primarily concerned with exploring social learning and how information and ideas passed through a social network can influence reproductive behaviour. Of particular interest is how communication about family planning works to enhance or allay the fear of side effects and the influence of side effects on contraceptive behaviour. Once an individual is exposed to information about family planning through either interpersonal or mass media channels, the way in which his or her contraceptive behaviour is influenced will depend in part on the content of the information received. When studying the influence of mass media family planning messages, it is generally assumed that the content of the

messages is positive and is encouraging the adoption of contraceptives. However in the case of interpersonal communications, discussions of the negative health consequences of family planning methods may predominate with the result that contraceptive innovation is frustrated. Studies have also shown that rumours and misconceptions about contraception can increase fear of side effects and frustrate adoption and reports from DHS surveys have indicated that this is one of the major reasons for non-adoption of contraception (Feyisetan, et al. 2003).

The content of messages is an aspect of family planning communication that is difficult to measure, particularly in quantitative studies and in the past researchers have cited the need to document the content of conversations about family planning in order to facilitate meaningful analysis of the impact of diffusion on contraceptive change (Feyisetan et al., 2003:50). Much of the negative information being communicated concerns the possible harmful health effects or side effects of contraceptive methods. 'One of the assumptions of a diffusion approach is that the innovation offers an indisputable benefit to the adopter' (Cleland, 2001:40) this may be true at the aggregate level however the individuals concerned may perceive things differently. Fear of side effects is among the most commonly cited reasons for non-use and side effects or health concerns are also the main reasons for the discontinuation of a method.

The focus of this study is on the links between side effects and contraceptive use behaviour, rather than the levels of contraceptive use per se or the ultimate effect of contraceptive use on fertility. As such the aim is not to make any contribution to theories of fertility decline but rather to use the ideas found in diffusion of innovation theory to inform the research. As previously discussed diffusion theory, in particular social learning is the concept that individuals can gain information relevant to their own decision making process from others in their social network. This study seeks to understand how the acquisition of information on contraceptive side effects influences individual's ideas about the costs and benefits associated with contraceptive use.

There are clear practical and policy implications in understanding how the communication of information about side effects influences reproductive behaviour. Family planning education can then best utilize networks to disseminate information or understand how networks may work as a deterrent to individual contraceptive adoption. As such women can then be made fully aware of all the outcomes and alternatives of contraceptive use and can make truly informed choices about what is best for them at any given point in time.

Chapter Three
Discussions, Perceptions, and Fear of Contraceptive Side Effects in Southern Ghana

3.1: Introduction

Previous quantitative studies, especially those based on DHS data, have highlighted fear of side effects as a reason for non-use of modern contraceptive methods. However 'fear of side effects' still remains an ill defined and poorly understood concept. There are multiple interpretations of the meaning of fear of side effects as measured by surveys such as the DHS. For example, are respondents referring to fear that a contraceptive method will make them physically unwell, or fear of social or economic repercussions from contraceptive use, or perhaps concerns over the effect of current contraceptive use on future childbearing. Each of these definitions would need different policy or programmatic intervention if the fear of side effects were to be minimized as a barrier to contraceptive use. In addition, for program intervention to be effective, an understanding of the origin or cause of the fear of side effects would be beneficial. These fears may be based on past personal experience of using contraception, from the observed or relayed effects on others in the community or may be perceived fears stemming solely from misinformation and rumors. In light of these differing mechanisms for the creation of fear of side effects a key explanatory element in this study is the spread of information about family planning.

3.1.1: Aims of study

The aim of this study is to use a qualitative approach to explore the multiple interpretations of the meaning and cause of fear of side effects in a particular social context. The study location is two villages in Southern Ghana which will provide the setting for an in-depth exploration of how women in those locations perceive and articulate the issue of fear of side effects. This paper goes beyond the limited range of information provided by survey data, and seeks to better define what is meant by the term fear of side effects in this particular social context. It also aims to determine on what information and from what sources this fear is constructed. The particular method employed in the data collection is focus group discussions which are used to gather substantive information while also providing insight into group dynamics and the nature of informal social interaction. The research questions that this paper aims to answer are:

- How do women in the study locations interpret the concept of fear of side effects and what are the causes and consequences of fear of side effects?
- To what extent does information about contraceptive use received through social networks influence attitudes and behaviours towards contraceptive use, specifically regarding side effects?
- Do women believe fear of side effects is a barrier to the use of modern or hormonal methods in their community?

3.1.2: Limitations

In common with all qualitative studies one major limitation of this study is its specificity. Only two study sites were used and given the small sample size and the nature of the sample selection process the sample cannot be said to be representative of the study population as a whole (Bryman, 1988). Therefore it is not possible to generalize the resulting data to a population beyond those individuals involved in the study. This is the expected outcome of this study and is not considered problematic. The underlying rationale for this study is to address the limitations of the quantitative and representative data currently available by investigating the issues from a different methodological perspective.

Another issue inherent to qualitative research is subjectivity which may lead to questions about 'the feasibility of seeing through others' eyes if observers themselves are so heavily implicated in what is found ' (Bryman, 1988: 77). The influence of the researcher both on behaviour in the field and during the process of analysis must be borne in mind and to consider this study as totally free from bias would be unrealistic. While some see this subjectivity as a weakness others think that qualitative methods are strengthened by 'the ability to acknowledge bias, value it and make its impact on the research process as explicit as possible' (Keenan Forrest & Teijlingen, 2004: 258). In line with Seales' (1999) checklist of criteria for the evaluation of qualitative research the possibility of bias introduced into the study through the methodology or data collection process is further disused in section 5.3.

An element of this study which could be considered limiting is that, in keeping with the previous papers in this thesis, the study included only female participants. It is of course recognized that men play an important role in family planning issues and reproductive decision making. The women in the study refer to their perception of men's involvement in the issue of fear of side effects but the perception of the men themselves is not sought. It is felt that in relation to this specific issue it is women who physically

experience the act of contraceptive use. Barrier or natural methods involving both partners rarely feature in the discussion of fear of side effects and although social side effects may often involve male partners it is the woman's experience of these with which this study is concerned.

3.1.3: Structure of Study

This paper is presented in five sections, the first of which has already outlined the background to the study and its aims and objectives. The second section provides a summary of some of the issues related to this topic which have been found in previous qualitative studies. Next, section 3.3 details the methodology used in the study. This includes sections on the methods used, the data collection process and the ethical considerations raised by the study. The results are presented in section 3.4, and finally the paper finishes with discussion and conclusions arising from the results.

3.2: Previous Studies

This section provides a brief discussion of some of the previous qualitative studies which have raised the issue of side effects or fear of side effects as part of their findings. The issues which are discussed include what exactly the components of fear of side effects are, how these are communicated between women and the social consequences of side effects, such as in cases of covert contraceptive use. These then lead on to a discussion of the implications for quality of care such as, content of family planning messages, quality of counseling and source of method supply.

Many previous studies, while not setting out to specifically investigate the issue of side effects, have determined that family planning and especially the potentially negative aspects are frequent topics of conversation amongst study participants. Rutenberg and Watkins (1997) conducted a study in Nyanza District Kenya which set out to discover the content of women's informal conversations about contraceptives to determine the effect of these interactions on contraceptive practice. In the course of their focus group study they found abundant evidence that side effects is the most common topic of conversation regarding family planning. The study participants identified two main fears related to side effects, first fears for their own health, and second fears for their relationships with men. The women in the study were concerned about the cost of treating ill health due to contraceptive use which is a potential source of tension as this responsibility will fall mainly on the husband. With regard to fears for their own health the study found that women did discuss unexpected and extreme side effects which the authors referred to as 'myths and rumors' however they talked more often about expected and more benign side effects such as nausea and irregular bleeding (Rutenburg & Watkins 1997).

Williamson et al., (2009) conducted a meta-ethnography of seven qualitative studies on modern contraceptive use among young women in developing

countries. They found that all the studies they looked at showed that concerns over experienced and perceived side effects of hormonal contraceptive methods were central to young women's non-use of these. Another study of young people in Mali (Castle 2003) found that rather than immediate health effects it is fear for future fertility which prevents young women from using hormonal contraceptives. Long term sterility was perceived to have severe social consequences such as the husband taking another wife or seeking a divorce and ostracism from the community in general. A study of side effects in Ghana by the Ghana Ministry of Health (1992) found a similar result and consequently many people believed using a contraceptive method is only acceptable for women who have had children.

One aspect of side effects particularly related to hormonal methods is the issue of menstrual disruption which Williamson et al. (2009) also find is a feature of the studies they reviewed. They conclude that methods which interrupt the perceived natural pattern of menstruation are unacceptable to many young women (Williamson et al., 2009). Other studies also cite the value women place on regular menstruation and the low tolerance of menstrual disruption as a side effect (Snow et al, 2002; Hardon, 2002). There may be many reasons for this as several authors point out that levels of tolerance of side effects will be dependent on the local context (Khanna, 1999; Henry, not dated; Hardon, 2002). The process of menstruation has socio-cultural, religious and psychological significance which varies in different cultures. Many women see their pattern of menstruation as a sign of their reproductive health and of their health in general and (Khanna, 1999). Hardon (2002) finds that amenorrhea can lead women to question whether or not they are pregnant which causes considerable anxiety if they are not adequately warned about this effect of hormonal methods. However in a study based in the Philippines, Henry (not dated) says that midwives reported that telling women that changes in menstruation are normal is not effective in reducing anxiety.

When discussing this issue Castle (2003) states that rather than being troubled by the physiological effects of hormonal methods it is really the social consequences of these side effects that induce fear. As mentioned previously women fear that side effects will cause conflict with their partner and this is particularly so if they are using a method covertly. Method users who are doing so without the knowledge of their partner or other family members face significant concern over method-related bleeding disturbances related to their need to maintain secrecy (Snow et al, 2002). A population based study in the urban Ndola district of Zambia found that 7% of current users were doing so covertly and where the husband was difficult to approach on the subject of family planning the participants were more likely to use secretly than not to use a method at all (Biddlecom & Fapohunda, 1998). Some of these women may face challenges to their right to privacy and confidentiality and the authors point to recent efforts to involve men more in family planning as a potential threat to privacy (Biddlecom & Fapohunda, 1998: 369).

Privacy in clinic setting is not only important to those who are using a method secretly. A study of side effects in Ghana by the Ghana Ministry of Health (1992) found that in some contexts the use of family planning is still associated with immorality and promiscuity and so lack of confidentiality and privacy at clinics is a significant barrier. The report concludes that 'while medical screening procedures are minimal or non-existent, privacy is highest at commercial sellers, probably a reason why the relative contribution of contraceptive distribution at commercial outlets is high in Ghana' (Ghana Ministry of Health, 1992: 15). These sales from commercial outlets, which do not involve any trained personnel, are not favored as it is believed the concept of family planning is not well understood within the population (Ghana Ministry of Health, 1992). This is a sentiment shared by the women themselves who believe that the risk of experiencing side effects is lower if a health worker is consulted and who attribute severe side effects to the improper use of methods (Rutenburg and Watkins 1997).

There is evidence from other studies that in fact when methods are administered by the user there may be inconsistent or illogical application of methods, sometime with unintended or even dangerous consequences (Gready et al, 2002; Hardon, 2002). A study of women's experiences of contraceptive services in South Africa found that this was due to inadequate or misunderstood instructions and the women in the study felt they had been given insufficient information on how methods work, side effects, and information about follow-up services (Gready et al, 2002). Even where personnel do undergo some training, as is the case for community based distribution workers, there is still evidence to suggest that knowledge and counseling on side effects is still lacking. For example, an assessment of the community based distribution programs in Ghana found that knowledge among the CBD agents on side effects of the pill was low and they did not provide adequate information on side effects and ways to manage them (Chege et al 2000). 'Very few agents or supervisors could correctly mention symptoms of severe side effects for which a woman should seek assistance. The majority of agents and supervisors knew what information to provide to a pill client who has forgotten to take the pill for one day but they were less knowledgeable when it is two days' (Chege et al 2000: 15).

The discussion this far has focused on information from health workers or CBD agents which is an important channel for the flow of information and ideas about contraceptive use. The theoretical framework within which this study is situated is diffusion of innovation theory which states that new ideas and behaviours can be spread through a network of people by individual channels of communication. Understanding the diffusion of reproductive behaviours is important to the study of side effects as diffusion effects have the potential to accelerate social change and where contraceptive use is still relatively new, social learning may help establish the properties of the contraceptive methods themselves (Montgomery & Casterline, 1998). As the innovation becomes more common so the social influence of others in the community accelerates the incidence of adoption (Cleland, 2001). While it

can be assumed that the majority of communication from a health worker to an individual is encouraging family planning this may not necessarily be so for communication coming from others in the community. This creates the possibility of negative diffusion effects, where 'rumours about health side effects ... can serve as barriers to contraceptive adoption by persons otherwise motivated to use' (Population Council, 2005). When women cite fear of side effects as a reason for not using contraception it is often attributed to misinformation and rumours regarding the possible effects of modern methods (Bongaarts & Bruce, 1995).

A study using focus groups and in-depth interviews in a village in India (Kirkconnell-Hall, et al. 2006) uncovered a social learning process with negative effects on the uptake of temporary methods of contraception. The study found evidence of large doses of contraceptive pills being taken without the guidance of a physician and subsequent reporting of side effects such as abdominal pain, nausea and vomiting (Kirkconnell-Hall, et al. 2006). These experiences were then related to other women whose perceptions of the risks associated with the use of hormonal methods were influenced. The authors concluded that 'women's lack of correct knowledge regarding mechanisms and side effects directly affects the risks that they perceive in using the temporary methods that are available to them. These perceptions are largely formed by the experiences other women relate to them, which in turn are coloured by a lack of understanding and confusion about the mechanisms'(Kirkconnell-Hall, et al. 2006). Henry (not dated) also found evidence of temporary methods being used contrary to recommendations or instructions. The study looked at women's experiences of side effects as a follow up to the findings of the DHS and found that women were using methods based on their bodies' response but contrary to the instructions they had been given by the service provider. For example women using Depo Provera would cease using the method when they experienced amenorrhea and then upon the return of their menstruation would go to their provider and request to continue with the method (Henry, not dated).

These practices may be creating an effect where problems are discussed within the social network and considered as legitimate side effects when in fact they are due to incorrect use. The study by the Ghana Ministry of Health found that most of the side effects mentioned by women in the study were real, but, there were also lots of unfounded fears which are likely influencing people's decision making. They concluded that there is a 'high awareness of possible side effects contrasting with modest actual experience' (Ghana Ministry of Health, 1992). When discussing contraceptive decision making Rutenburg and Watkins (1997: 297) found that decisions about contraceptive use are 'preceded by a period during which women overhear or participate in conversations with others, and then by more strategic conversations when women seek out those whom they believe are using contraceptives'. In this gathering of information formal dissemination of information from the health sector is important but ultimately women are more convinced by the opinions and attitudes of people they know. The most salient characteristic of the person who is trusted to give advice is that they are women who others believe have some past personal experience of FP because they have used it themselves (Rutenburg and Watkins 1997).

In Ghana there is a growing motivation to limit fertility and space births, young people are expressing doubts about the economic advantages of large families and birth spacing is seen as essential for both mother and child health. This combined with traditional methods increasingly being seen as a burden leading to quarrels and confrontations indicates there can be substantial motivation for some women to use modern methods (Ghana Ministry of Health, 1992). Snow et al. (2002) found that this high level of motivation can be powerful enough that they are tolerating substantial discomfort in order to contracept, and even long episodes of use cannot necessarily be regarded as a sign of satisfaction with the method.

3.3: Methodology

This section begins by outlining the method of data collection used for this study and the theoretical arguments behind the decision to use this method. Then the process of feildwork and data collection is described including a detailed description of the study areas, the research team and the design of the study. A description of the data analysis strategy is given and finally there is some discussion of the ethical issues considered in this study.

3.3.1: Methods

Focus group discussions are the primary method of data collection and are used to provide substantive information from the perspective, and in the words, of the participants, while also providing an insight into group dynamics and informal social interaction. The focus group data is supplemented by interviews with service providers and other local stakeholders.

The focus of this study is on interpersonal communication about family planning and as such focus groups, as a research method are particularly appropriate to this research question. Focus groups can provide access to group meanings, processes and social norms (Bloor et al, 2001), and by extension explore normative behaviour in terms of reproductive activities. This is vital to this study as in the words of Bloor et al (2001:21) socially constructed 'norms of behaviour remain the mainsprings of human action' and the situation of the focus group can provide occasion and stimulus to articulate those normally unarticulated normative assumptions. Another area in which focus groups are useful is the investigation of the gap between educational messages and a community's beliefs and understanding (Litosseliti, 2003). This is particularly relevant in this study where one aim is to determine the source of 'myths' regarding contraceptive use and how messages from health workers are perceived. The nature of the topic is also a

consideration in the choice of methodology and in this case the topic should be considered somewhat sensitive. Although contraceptive use is relatively common in the study locations and this does not need to be considered a taboo topic, it certainly is a private and personal subject and needs to be handled with some sensitivity. Wilkinson (2004: 180) believes focus groups are particularly appropriate to sensitive topics and that the group context 'may actually facilitate personal disclosures'.

A particular strength of focus groups in the context of this study is that they are a socially oriented event which brings together a group of people in order to explore views, attitudes and perceptions that occur in real life social situations (Litosseliti, 2003). This speaks directly to the aim of this study which is concerned with the meanings attached to the everyday informal inter-personal communications between individuals. The social orientation of focus groups contextualizes respondent responses and produces 'simulations of everyday discourses' (Flick, 2002: 121) where participants influence and are influenced by others. However this is not an observational study of real life interactions among a naturally constructed group but rather a simulation created and staged by the researcher. Morgan (1997) argues that the control of a focus group by the researcher limits the naturalism of the interaction and Litosseliti (2003:23) notes that 'caution must be taken in suggesting that focus groups can replicate how people communicate within other group settings.'

This replication of a natural setting has the advantage of allowing for free-flowing discussion where participants are able to respond in their own language and vernacular, as opposed to choosing from a list of pre-defined responses (Wilkinson, 2004; Litosseliti, 2003). This results in rich data that arise in a natural or indigenous form with minimal imposition by the researcher and which is illustrative of, and appropriate to, the local context (Stewart & Shamdasani, 1990). Focus groups are designed to 'understand how individuals conceptualize and categorize phenomena' (Stewart &

Shamdasani, 1990:41). Using this methodology in a field study avoids pre-judgment of the nature of the phenomena and does not require the construction of hypothesis based on a priori assumptions (Shaffir & Stebbins, 1991) rather the focus group elicits information in a way which enables the researcher to find out why an issue is salient to the participants (Litosseliti, 2003).

Another relevant aspect of focus groups to this study is the insight they provide into group dynamics and interaction. As mentioned above inter-personal communication is thought to play an important role in the adoption of behaviours and focus groups could provide information on both the perception of issues and the ways in which people are influenced by others (Litosseliti, 2003). Complex networks of inter-personal communications can be difficult to study but interaction between participants is a key feature of focus groups. The interaction between group members produces insights that would be less assessable without the group and will typically capture more of a range of communicative processes than interviews (Wilkinson, 2004). Participants respond to and build upon views expressed by others in the group and the data contains both consensus and diversity brought about by group interaction (Morgan, 1997).

While the previous paragraphs highlight the strengths of focus groups in relation to this study there are also limitations associated with the methodology. The ways in which messages are interpreted and reproduced, focus groups may not be the best method of mapping individuals' behaviour change, as the social context may mean intra-group variations are likely to be under reported (Bloor et al, 2001). In common with all qualitative methods the results are not representative and data is limited to the verbal and self-reported and relies on the retrospective recall of events and information by respondents (Morgan, 1997). The data are subject to potential bias both at the time of collection and in the analysis where it is subject to the interpretation of the researcher. People's motivations are complex and

participants may rationalize their behaviour or give false information in their desire to please the researcher (Litosseliti, 2003). The focus on the group also makes it difficult to distinguish between individual views and the group view therefore it is possible that the group may present a false consensus.

3.3.2: Data Collection

Data was collected in the Cape Coast area of Southern Ghana during a period of fieldwork from July to October of 2007.

3.3.2.1: Study Areas

Two study locations were chosen in the Central Region of Ghana both of which are approximately 30 kilometers from the town of Cape Coast. These two locations are two of the six study locations in the Cape Coast Social Learning, Social Influence and Fertility Control Survey which conducted a longitudinal household survey between 1998 and 2003. This data forms the basis for chapter 4 in this thesis and so in order to spatially and contextually tie the studies together two of the same locations were used for the qualitative data collection. The six locations in the survey were originally chosen to provide maximum heterogeneity and each differs in terms of ecological setting, economic activity, ethnicity, or kinship system. The two locations for this study were chosen to provide some diversity in terms of economic activity and ecological setting but to retain enough homogeneity in terms of language, ethnicity and religion so that the results remain comparable. Although the dominant ethnic and language groups of the two villages are different both are members of the Akan-speaking groups and, as the primary lineage type follows from the ethnic composition, both villages follow a matrilineal system. Table 3.1 below outlines some selected characteristics of each location.

Table 3.1: Characteristics of the Two Study Locations

Study Area	**B**	**A**
Location	Coastal	Inland
Primary economic activity	Farming, Fishing	Farming
Primary ethnic/language group	Fante	Twi
Primary religious affiliation	Orthodox Christian	Orthodox Christian
Total Population 2000*	1,294	588
Total number of households 2000*	242	143

*(Ghana Statistical Service, 2005)

Location A is a small village located inland in the Twifo Hemang-Lower Denkyira district of the central region, and the primary economic activity is subsistence farming. The village is located on a main road providing good access to public transportation. The village is used to the presence of tourists and visitors due to its close proximity to the Kakum Forest Reserve which is a major tourist attraction in the area. Location B is a coastal village in the Komenda Edina Eguafo District of the central region. The primary economic activity is fishing but there is also some income generated through the production of salt. The village is situated approximately 5 kilometres from the main road and access to the village is by a paved road which dead ends in the village. Public transportation is available in the form of shared taxis or Tro Tros. The village is host to a tourist class beach resort and as such the presence of visitors and foreigners in the area is not a novelty, although tourists rarely visit the actual village itself. Both villages are connected to mains electricity and water is supplied from covered wells or in a few cases piped direct to houses or compounds.

3.3.2.2: The Research Team

The decision was taken to hire a local research team for the data collection as it was felt this would bring a number of advantages to the study. Most importantly it enabled the focus groups to be conducted in the local languages, Fante and Twi. Although English is the official language of Ghana and is widely spoken it is usually taught in school so in situations where participants may be poorly or uneducated, fluent English is unlikely. As such it was felt necessary to conduct the groups in the local languages to enable all participants to contribute equally and not be restricted by language issues, while avoiding the complication and time implications of simultaneous translation. The interviews with service providers were conducted by the researcher herself in English. Another advantage of using indigenous research assistants is their familiarity with life, culture and expected norms of behaviour in the study locations. This knowledge was particularly invaluable in the initial stages of negotiating access and dealing with the sometimes complicated hierarchy of village leaders.

Two female research assistants were hired; the first was the focus group moderator who was a research assistant in the Department of Geography and Tourism at the University of Cape Coast and the second who acted as assistant to the moderator and was an MPhil student of the same department. The final member of the field team was the researcher herself who was present at all times. Although not familiar with reproductive health topics or research the assistants were chosen based on their knowledge and experience of conducting focus groups. Initially a four day skills training programme was planned based on that developed for relatively unskilled bilingual focus group facilitators by Maynard-Tucker (2000). This needed to be adapted given the expertise of the research assistants and the training programme was subsequently focused more on the topic of the research than the data collection method. Part of the training consisted of a pilot study which is described in detail in section 3.3.2.3 below. The selection of the

research assistants was also influenced by their personalities and personal characteristics which were suitable and desirable in relation to the intended study design. The two field research assistants were specifically constrained to be female as research on interviewing regarding sensitive topics has suggested that respondents are generally more comfortable with interviewers of similar social characteristics including gender (Lee, 1993). The other three team members consisted of two females and one male, along with the researcher who is female.

Subsequent to the data collection the audio recordings were simultaneously translated and transcribed by a further three members of the team who were also students of the University of Cape Coast and were selected based on their language skills. These team members also received 2 days of training in the research topic and transcription techniques, and were provided with detailed instructions as to exactly what was required by the research in order to enhance standardization in translation. All transcriptions were checked and verified by both the moderator and assistant moderator. Interviews with service providers and key informants were conducted by the researcher in English. The researcher and two of the research team are pictured in Figure 3.1, in village location B in September 2007.

Figure 3.1: The Research Team September 2007

As Rutenburg and Watkins (1997) point out the imbalance of power and the expectation of gains on the part of the participant communities undoubtedly has some influence on the data, especially where the economic distance between the parties is perceived to be great. In the case of this study every attempt was made by the research team to be clear with the participant communities as to the purpose of the study and the outcomes for the community. This imbalance of power is one of the reasons the decision was taken to hire local research assistants to collaborate with the researcher and lead the groups in the local languages. It was hoped that by doing this the participants would feel more comfortable and at ease during the groups. It must be kept in mind however, that the research assistants while originating from the local area, were both currently urban residents and highly educated university staff or students. Therefore the study participants may still have perceived a significant imbalance between themselves and the indigenous researchers.

The field study was kept as low key and unobtrusive as possible and attempts were made to lessen the perceived differences between the researchers and

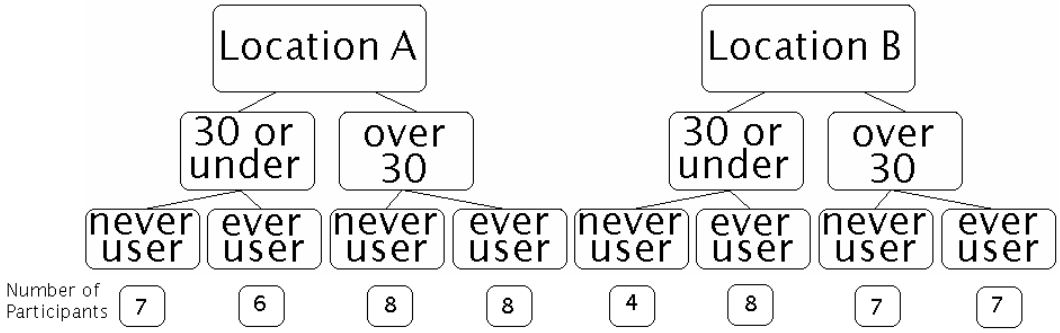
the study communities. For example whenever possible the research team travelled by public transportation and care was taken over style of dress so as not to appear too formal. Despite this the presence of a white foreign researcher did create some disturbance particularly on the first visits and during screening when it was necessary to announce the presence of the research team to the whole village in order to attract participants. The repeated presence of the research team in the study locations led to a certain level of familiarity and acceptance when the groups were taking place and while this effect on the data in acknowledged it is believed to be minimal.

3.3.2.3: Study Design

Each group contained between 4 and 9 participants and in each of the two study locations groups were composed according to two participant characteristics. The desired number of participant in each group was between 6 and 8 as it was felt that smaller groups would allow for a more in-depth level of discussion without placing undue burden on any single participant. This was achieved in all but one of the groups, which only had four participants. Firstly participants were grouped according to age with groups comprising those aged 30 and under or those aged over thirty. This distinction was made based on the findings of the GDHS 2003 that women aged less than 30 are more likely to cite fear of side effects as a reason for non-use than women aged over 30 (Ghana Statistical Service et al, 2004). The groups were then also separated according to their history of contraceptive use into never users and ever users to provide some homogeneity in the personal experiences of family planning within the group. This was done with the dual aim of creating a permissive and comfortable environment for the participants and aiding the analysis of the data, which is focused at the group rather than the individual level (Bloor et al, 2001). The groups were not broken down further to preserve enough diversity to encourage discussion and provide a range of opinions. A diagram

showing the multiple-layer specification of groups is shown in figure 3.2 below.

Figure 3.2: Focus Group Specification Diagram



Pilot Study

One pilot focus group was conducted in a third location prior to the start of data collection. This enabled refinements to be made by the research team to both the screening questionnaire and the focus group schedule. The location of the pilot study was chosen for convenience and based on its proximity to the University of Cape Coast and the prior acquaintance of the village assembly man to the researcher. The screening was relatively chaotic and disruptive compared to the actual data collection for a number of reasons. Firstly the research team only visited the screening location once, due to the arrangements having been previously made with the assembly man off site. This resulted in the research team drawing significant attention by their presence and a crowd of onlookers gathering. Secondly the screening and the focus group were conducted on the same day due to time pressures, which was a Saturday. This meant that there were more people than usual in the village including many children who were not at school and whose attention was also attracted as explained above. This of course had a significant impact on the process of conducting the pilot study and especially at the screening stage caused somewhat of an ethical dilemma related to the

privacy of the participants. This was mitigated as far as possible by conducting the individual screening questionnaires and the actual focus group itself as far away from the main screening location as was feasible to allow for maximum privacy and minimize the potential for eavesdropping. This created some logistical difficulty at the pilot location but was not an issue during the actual data collection for the reasons previously mentioned in section 3.3.2.2 above and in the sections on data collection sites below.

As a result of the pilot study some small adjustments were made to the focus group schedule and one change was made to the eligibility criteria. Prior to the pilot study participants were asked if they had ever discussed family planning with anyone, and were only considered eligible if they responded that they had. This criteria was removed after the pilot as the numbers of women responding that they had discussed family planning was very low and was restricting the available pool of participants unnecessarily. In addition it was felt that this question was potentially interpreted in different ways by participants. It was noticed during the pilot screening that a few women who reported being ever users of contraceptive also reported that they had not discussed family planning. This struck the research team as incongruous and so these women were further questioned. In some cases the women responded that they had discussed family planning with a health worker but thought the question referred only to discussing with their peers, yet in others exactly the opposite explanation was given. Rather than attempt to reconcile this, the eligibility criteria were changed.

Question Route Design

The question route was designed following the recommendations of Kruger & Casey (2000) and a copy is attached as appendix 3A. The local research team was given an opportunity to comment on the question route before the data collection and also to make any changes following the pilot study. The questions were not translated into the local languages in writing as the

moderator felt this was unnecessary as the local languages do not have a strong written tradition and she was more comfortable working in written English.

Participant Selection

The fieldwork process began with negotiation of access to people living in the locations with the leaders of the local communities. First the assembly person was contacted and the purpose of the study was explained. The assembly person then facilitated a meeting with the village chief, or in the case of location A where the chief is absent with the queen mother. The chief and queen mother were then visited and brought the traditional gift of a bottle of schnapps, so that a libation ceremony could be performed. Following the granting of permission by the chiefs and the deciding of a suitable date for participant screening the village announcer or gong beater was hired to go around the village and invite women aged 18 to 49 to present at a designated time and location if they were interested in being screened to participate in the study. Once participants had gathered they were given a short verbal introduction to the study and then invited to take a screening questionnaire which is presented in appendix 3B. Once identified as eligible participants and placed into the appropriate group individuals were asked if they would like to participate and told where and when their group would take place. In cases where a potential participant was unsure of their age a visual judgment was made by the researcher administering the screening questionnaire.

Locations

Previous focus groups discussions conducted in northern Ghana by Adongo et al (1997) found that interruption or casual participation by non-respondents was a problem. They felt it was paramount to choose a study location that was relatively secluded from the general public but yet still familiar to the participants so as to put them at ease and not overly inconvenience them. In Location A the pre-screening took place in the community centre pictured below in figure 3.3, and the groups themselves took place in the room to the rear of the community centre pictured in figure 3.4.

Figure 3.3: Screening Location A

This location was relatively private and the ability to close the doors meant passers by could not see into the room. However the location was noisy particularly due its proximity to the road which is busy and supports very heavy traffic such as logging trucks from the nearby forest reserve.

Figure 3.4: Focus Group Location A

In Location B the screening took place outside in front of the royal palace where there was space for the respondents to sit down at the side of a building. The groups were conducted in the porch space of a nearby house. The space was enclosed on three sides and was open to a path on one side. The path was not heavily used but when people did walk past they could observe the group. It was felt that this location was acceptable as the participants could also observe passers by and chose to stop speaking if they wished. The location is shown below in figure 3.5.

Figure 3.5: Focus Group Location B

3.3.3: Analysis

The data resulting from the focus group discussions and interviews with service providers was analyzed using a process of analytical induction. Analytical induction is described by Bloor et al (2001:66) as 'a means to derive explanatory hypothesis which apply to all of the data available on any particular phenomena.' This process uses a progressive stepwise procedure of developing and revising hypothesis which are then compared with all available evidence. Deviant cases are included in the analysis and are used to force revisions of the hypothesis until the hypothesis fits all the cases. The

analysis considers the substantive content of the data looking at the ideas issues and themes in the participant's comments. Both consistency and contradiction in attitudes and arguments are considered along with the frequency and extensiveness of an idea. Other aspects of the data are also included in the analysis such as the context of the comments, if they are prompted by other participants, if they are vague comments or specific responses, and the tone and intensity of comments. Also considered are aspects of non-verbal communication such as group mood, spontaneity and body language recorded in the field notes at the time of the data collection.

The transcripts were analyzed with the aid of Nvivo Version 2. Each transcript was initially coded in a deductive thematic framework based on the original focus group schedule. An inductive and analytical process was then carried out to develop a more detail coding schema for further coding and analysis. The unit of analysis in this study is the group, comparisons are made across groups and individuals within groups are not identified. The results of the study are presented with the use of verbatim quotes to illustrate the issues arising in the original words of the participants.

3.3.4: Ethical Consideration

Ethical approval for this study was sought prior to the commencement of fieldwork from the Ethical Review Committee of the School of Social Sciences, University of Southampton. The Ethical Review application is reproduced in its entirety in Appendix 3D. Appendix 3E presents a copy of the leter of approval recivied from the Ethical Review Committee on 2nd July 2007.

As previously mentioned the topic of this study is relatively sensitive in nature and raises some issues which have the potential to cause distress for the participants. Issues may be raised such as recalling stressful events such

as episodes of poor health due to adverse side effects or family conflict over the use of contraception which could cause a participant to become upset at the time of the discussion. In this study the research team took collective responsibility to ensure the well-being of the participants and monitor for signs of distress. Oliver (2003) also points out that participants may be happy to get a chance to talk about their life and overall may feel more valued and have an enhanced sense of their own self worth.

There is also the issue that the members of each group will likely know each other in some respect and will possible have to face each other again in daily life. There are arguments within the literature about the effect of conducting focus groups with participants who know each other and there is a possibility that participants may be more reluctant to disclose personal information in a group of people they know and are likely to see again. However, in village settings such as those in this study it is virtually impossible to put together groups of participants who do not already know each other to some degree. It is felt that the topic of contraception and contraceptive use is not sufficiently sensitive as to present a problem in this regard and participants will be made aware in the informed consent process that they may refuse to answer specific questions or disclose certain personal information if they wish. All participants will be asked to keep the contents of the discussion confidential during the informed consent process and this will be re-iterated to them at the end of the discussion.

Anonymity and Confidentiality

The anonymity of the participants is preserved in a number of ways. When the focus group tapes were transcribed names of individuals were not used and any personal and identifying information disclosed by participants was excluded. Only the research team was present at the time of the data collection and every effort was made to provide a private location.

3.3.4.1: Informed Consent

The process of gaining informed consent is central to the research process and consent was gained from each participant before each focus group began. The process of informed consent usually involves a written information sheet and a form to be signed by the participant formally giving consent. However this process does not take into account the socio-cultural setting of this study in which a proportion of the potential participants can reasonably be expected to have low literacy skill and a limited educational background. According to UNESCO statistics the adult female literacy rate in Ghana for 200-04 was 65.9%, which suggests that given a random sample one could expect one third of potential participants to be illiterate (UNESCO, 2005). Van Den Hoonaard (2002) points out that informed consent must be tailored to the circumstances of the potential participants and take into account participant's skills including level of reading recognition and comprehension. Further to this Oliver (2003) notes that a way should be found to explain the basics of the research to the participants in a manner which they understand which may involve overcoming limitations of language and limited education. In its guidelines for research involving people in developing countries the Wellcome Trust (Undated) state the following:

> *'The process [of obtaining consent] is more important than the signing of a consent form, which should only be regarded as evidence that a consent process has been carried out. Written consent may not always be the most appropriate form of recording consent, for example where participants are visually impaired or illiterate.'*

In this study the basics of the research and the issues of anonymity, confidentially, withdrawal from the study, and audio recording were verbally explained to participants by the moderator before the discussion began. The

moderator gained a verbal response from each participant on a number of questions designed to check consent. The explanation and the check list are included as appendix 3C.

3.4: Results

3.4.1: Service Provision

Prior to the data collection an audit of the family planning service provision in and around both locations was undertaken to establish the relative ease or difficulty of accessing services in these locations. It is important to note that this audit was not exhaustive so it is possible that other sources of services exist but have been overlooked, particularly if they are private clinics or commercial locations selling pills. Table 3.2 summarizes the service delivery points according to proximity to each location.

Table 3.2: Location and Services of Family Planning Providers

	Type of provider	**Distance from village**	**Services provided**
Location A			
1	Family planning agent	Resident in village	Distributes pills, makes referral appointments, IEC activities
2	GHS clinic	2km (main road)	all services except IUD and implants – refers to district hospital
3	GHS clinic	15km (10km main road plus 5 km off main road)	all services except IUD and implants – refers to district hospital
4	GHS clinic	20km (main road)	all services except IUD and implants – refers to district hospital
Location B			
1	Agent/pharmacy	Resident in village – pharmacy is in next village ½ km	Distributes pills, makes referral appointments, IEC activities
2	Private health care clinic	5km (at junction w/main road)	all services except IUD and implants
3	Local hospital	20km (5km to main road then 15km)	All services except IUD
Referral Hospitals			
1	Cape Coast District hospital	approx. 30km from both locations	All services
2	Cape Coast Central regional hospital	approx. 30km from both locations	All services

As table 3.2 shows neither of the villages have a clinic but both have an individual who acts as a family planning agent and is resident in the village. In location A this is an official agent who is 'employed' and trained by the Planned Parenthood Association of Ghana (PPAG). In location B there is no official agent but the role is taken by a local resident who works as a nurse's assistant in the nearby local hospital and provided IEC activities and assists people with obtaining pills from the pharmacy in the next village. In location A there is a GHS clinics with all temporary methods except implants and IUD are within walking distance of the village. In location B there is not clinic within walking distance and only pills and condoms are available at the pharmacy. Temporary methods are available from the small local hospital which is nearby but not within walking distance. For access to the methods not available in the clinics or local hospital women are referred to the larger family planning units within either of the hospitals in Cape Coast. Given the locations of both villages on or close to main roads and the good availability of transportation there are no significant physical barriers to accessing services in either of these villages, although in location B the services are further away.

3.4.2: Fear of side effects

One of the central aims of this study is to gain some insight into what exactly 'fear of side effects' means to women in this particular context. In every one of the focus group discussions the issue of side effects was raised spontaneously by the participants in response to general questions about family planning. There is no doubt that the term 'side effects' is well known in these communities and by extension the concept of fear of side effects. However when asked to describe fear of side effects in more depth many of the responses were vague and non-specific:

'When you do it, it results in some sickness or diseases which can worry you' (Over 30, ever user, location B)

Where reference was made to specific symptoms which were believed to be side effects of contraceptive use, these were most often what would be considered to be 'expected' or common side effects based on the clinical literature. The specific side effects participants reported knowing about are dizziness, headaches, palpitations, nausea, weight change and menstrual disruption. More unexpected, or unlikely, side effects were mentioned although not frequently in comparison to the more likely effects already mentioned. Condition such as high blood pressure, diabetes and asthma were all discussed in relation to contraceptive use. In a few cases participants raised the idea that the side effects of using a contraceptive method could ultimately result in death. The following exchange shows that this opinion may not have been shared by all participants some of whom may not have considered this to be a serious risk:

Moderator: If one says she's afraid of the consequences of the family planning, what does she really want to tell us?

Participant 1: Death

Participant 2: Oh no please don't say this [laughter]

Moderator: Please allow her to speak. What did you say?

Participant 1: If one says she's afraid you may think of death.' (30 or under, never user, location A)

As discussed in the previous literature the fear of side effects is often dismissed as being a result of wild rumors of very severe, but ultimately very unrealistic, side effects. This study shows that this is not the case in these communities where the women are most concerned over the impact on their quality of life of expected and common side effects, especially of hormonal methods.

Another component of fear of side effects which was discussed is the potential for contraceptive use to impact on future fertility. Specifically these fears are of difficulty in getting pregnant or total infertility, requiring surgical intervention at future deliveries and in extreme cases the death of babies before or during delivery:

> *'There are others who complain of complications during pregnancy or death of their babies because the family planning was for longer period.'*
> *(30 or under, never user, location A)*

Although it is unlikely for complications at future births to be caused by past contraceptive use, it is the case that some hormonal methods, notably the injectable, which is a popular method in this setting, can cause a delay in return to fertility upon discontinuation. This in itself is not problematic provided the user has been adequately counseled and knows what to expect prior to adopting the method. In contexts where neonatal and maternal mortality remain relatively high it is not unreasonable for women to rationalize this type of event by placing the blame on the most obvious, and perhaps the only, western medical intervention previously experienced.

Besides the fear of physical side effects and potential future fertility issues another area of concern which was raised by the groups is the social or physiological side effects of use. This can be related to experiencing a physical side effect, such as menstrual disruption, which while medically innocuous can have significant impact on women's day to day life and on their relationships with others, particularly their husband.

> *'There are instances where instead of the normal five days menstruation period it takes about two months and this creates problems between spouses because the man might think you are just pretending in order to keep him away from your bed.' (Over 30, ever user, location A)*

A second aspect of this issue is related to the perceived social stigma of using a method at all regardless of whether or not a physical side effect is experienced. Rather than coming from husbands or other men, this general disapproval of contraceptive use seems to come from other women who may cast aspersions on the motivation of users. As described by one female service provider:

> *'Something like the women here when the other women see them coming in for family planning, it's like when you do family planning it prevents you from getting pregnant okay, so if you are a bad women and you want to go behind your husband and you want to sleep with a lot of men then you do family planning so that you don't get pregnant okay. So people don't even want their peers to know that they want to do family planning, okay they don't want to talk about family planning because when you talk about it you want to do something abominable, do you see? So it's one of the things that deter people from coming to do family planning. This happens in the community, in the typical community.'*
> *(Family Planning Service Provider, Cape Coast District Hospital)*

3.4.3: Causes of Side Effects

It is clear that many women in these communities perceive side effects from contraceptive use to be extremely common, which leads some to feel that side effects are an inevitable consequence of modern method use. One issue which causes concern and confusion among some women is the unpredictable nature of side effects and the seeming randomness in who suffers side effects and who does not:

> *'Some people do it and do not experience even headache and what baffles me most is that, they say when you are going to do it, they first look at the one which will be suitable for you before they do it. So why is it that it still poses problems. That is what I also don't understand.' (30 or under, never user, location B)*

This represents a serious problem for service providers who may struggle to counsel women effectively on what to expect given the inherent unpredictability which they find difficult to come to terms with. While some participants acknowledged the randomness of the occurrence of side effects others pointed out that in their experience side effects most often occur when there is some flaw in the process of administration of the method, or in some cases are directly caused through actions of the individual user themselves. For example the following quote illustrates that the participant believes the negative outcome in question would not have happened had the women been honest with the service provider:

> *'As for the family planning there are instances where the fault is from the individuals themselves. I happen to know one lady who went for the family planning and was asked if has had her period and she answered yes but it was not true and the nurse administered the drug. Later this lady was experiencing blackout as result of the reaction between the pregnancy and the drug and she had to be taken to the hospital until the doctor found out she was pregnant and directed her to the lab for a test which revealed everything before she was treated but she lost the baby all the same. I think some of them do not tell the truth when questioned and that is one of the reasons for the negative effect.' (30 or under, never user, location B)*

In the case above the individual had consulted a service provider but had failed to give correct information, however the service providers themselves see a problem with side effects arising in particular from those users who do not have any contact with clinic personnel when they obtain and use their method:

> *'Because if one has gone in for lets say Norplant it does not mean that you must also go in for Norplant, if one is using condom or contraceptive pill, any of the others does not mean that you should also go in for the same because you have to be screened. Sometimes some of them go to drug stores and buy the drugs themselves. Not knowing even how to start using them, you see they go to drug stores and begin to buy the, the tabs, the 28 day type and begin to use them, without consulting anybody.'*
> *(Female Service Provider, Private health care clinic, Near Location B)*

The quality of these drugs is unknown, and they frequently do not come in the original packaging or with instruction legible to the women in these communities. The success of social marketing of oral contraceptive and their widespread availability is a benefit to the many women who are obtaining their contraception this way and might otherwise not be able to assess a method at all. However the safety of this unregulated access is an issue and one consequence of this might be an increase in side effects arising from incorrect method use or lack of knowledge of what to expect on the part of the user. Participants also see consulting with a service provider as a crucial element in the avoidance of side effects in relation to method choice. Participants expressed the idea that side effects come as a result of the method being unsuitable for their body. This is one of the reasons why providing a wide range of different methods is considered a key element in assessing the quality of family planning programmes and their service provision. Where side effects are experienced, switching methods may be the most appropriate course of action and some trial and error may be involved before the right method is found. Offering the user an informed choice of a range of methods is a vital component of providing quality services, however many participants expressed the feeling that they did not want to make these choices for themselves.

> *'...whenever I decide to go for a family planning I will see a doctor and let him advice me on which of the methods that may be suitable for me instead of making my own choice.' (30 or under, never user, location A)*

Some women believe they are not capable of choosing their own method but rather by visiting a clinic and getting the appropriate 'lab test' 'blood test' or 'examination' the most 'suitable' method for a particular women can be determined. It is therefore seen as the fault of an individual user if she either does not see a service provider, or she chooses her own method and then experiences side effects. This view is extended even further by some who see side effects as a failure on the part of the service provider to correctly determine the most suitable method for each individual:

> *'It [side effects] is also the fault of the family planning officers because it is the responsibility of the officers to determine which of the methods or drugs will be suitable for the individual since the person has no idea or knowledge about the family planning method.' (30 or under, ever user, location A)*

Rather than seeing individual choice of methods as a sign of service quality the participants believe individuals are not in a position to be able to make these choices for themselves and if the choice is placed in their hands this is viewed as an indictment of the family planning programme. In the view of these women it is up to the service provider to encourage a woman towards a particular method which they believe is most suitable for her.

3.4.4: Other Explanations for Side Effects

Besides incorrect method choice, the focus group participants were also in agreement that another major cause of the side effects they hear of is not actually side effects at all. Rather symptoms of another illnesses or conditions unrelated to contraceptive use are being classified as side effects and blamed on the method used:

'Even if the condition was there and manifested after the family planning, she is likely to blame the family planning as the cause of the problem.' (30 or under, never user, location A)

Although the participants accept that this happens frequently they find it difficult to distinguish between the different possible causes of symptoms', especially when the individual concerned believes their symptom to be a side effect of contraceptive use. Even in cases where the user herself does not believe her symptoms are a side effect she can still face significant pressure to stop, from others who are aware of her status (as a contraceptive user) should she become ill for any reason. This experience is typified in the quote below from a current pill user in location B.

'I remember two years ago I had a terrible stomach ache and my mother was putting the blame on the family planning, she even warned me to stop the family planning medication but I refused because I knew it was not true. We have had many such situations in this town where all sicknesses are unnecessarily blamed on family planning.' (Over 30, Ever user, Location B)

In this case the individual was able to stand up to her mother and did not stop taking the pill, however this level of autonomy may not always be the case and this could be the cause of contraceptive discontinuation while still at risk of an unwanted pregnancy. This is one reason why many current users in these communities chose not to make their status known amongst the community members in general or even members of their own family.

3.4.5: Covert Users

As noted above users can sometimes face significant pressure from others to stop using their method, particularly if the user is sick or it is perceived that they are experiencing a side effect. They may be subjected to many stories about the potential consequences of using family planning which are a source of fear and unease for the current user who is put in a highly defensive position. A few respondents who were current 'never users' stated that if

they were to adopt a method they would keep this a secret from their friends and family as a way of avoiding such negative interactions.

> *'If you are to listen to what people say you will never tell anyone you are involved in family planning because you may get heart attack from just listening to what people say.' (Over 30, ever user, location A)*

For this reason it is believed that many users keep their status a secret from their peers, family and sometimes their husband. The participants described discussing their own use of family planning in terms of 'making a confession', although it is worth noting that most did not appear to hesitate to discuss their own use in the focus group context, despite being reassured that they did not have to reveal personal information if they did not want to.

3.4.6: The Flow of Information and Influence

The above discussion on covert use also has implications for the flow of information regarding family planning through informal social networks. Clearly in some cases knowledge, and fear, of side effects comes from personal experience but in a great majority of cases it comes from the transition of knowledge through social networks. The content and accuracy of the information being transmitted is influential in the collective level of knowledge and attitude to family planning within the community. The majority of the respondents agreed that family planning is a frequent topic of conversation and most had at sometime discussed family planning with someone in their informal social network. Similarly all of the service providers believed that women in their communities are commonly discussing family planning amongst themselves. Although some positive conversations were reported by all groups overall the participants clearly expressed that the overwhelming majority of informal discussion about family planning center on negative aspects.

'Some talk about the positive effect that it helps you space the birth of your child and help the mothers to be 'free' but they usually emphasize on the negative effect.' (30 or under, ever user, location B)

Comments such as that above were voiced by many participants in all groups and there was a clear consensus among group members that the balance of the content of discussions was towards the negative. Some of this negative discussion reflects a general opposition or ambivalence towards family planning but mostly it is regarding the specific side effects or health concerns associated with using a particular method.

'People normally talk about its side effect rather than its positive parts. Like at times it helps but … the moment you mention it, the problems are addressed first.' (30 or under, never user, location B)

Women in these study locations discuss the use of contraceptive methods with others in their community and consider their peers as a source of information and advice. If actively seeking information women are most likely to go to those who they know are current or ever users of a contraceptive method. Although much of the information participants are hearing comes from second hand sources, people known to have first hand experience of using a method are considered the most reliable source of information. These women are also considered to be the most likely to relate a positive experience with family planning.

'Or you will listen to someone who has benefited from it so that if you want to do it and you are scared, she can tell you that what she did was good for her and so you should do it. I think these are some of the people we can talk to, to lessen your fear.' (Over 30, never user, location B)

Information coming from people believed never to have used a method themselves is dismissed as rumors and gossip and in general their advice is not sought. This creates something of a dilemma as current and ever users

are potentially the most influential people in the community however as previously discussed they often prefer that their status as current users not be widely known. Current users are encouraged by health workers to motivate others; however there are potentially real consequences for these women if they choose to disclose their status publicly. Additionally where past users have had negative experiences, for any of the reasons discussed, and are sought out for advice, these single stories can spread through the network and become very influential.

3.4.7: The Effect of Counselling

Ultimately the most trustworthy source of information is health care providers. None of the participants raised any specific objections or barriers to attending a clinic for family planning services or to discussing family planning with health workers.

> *'We have to believe the doctor or nurse because they have the knowledge about it. They know what is good for you or otherwise, than someone who do not know anything about it. Those people you can't trust them. So if I should believe anything, it should come from the nurse.' (Over 30, ever user, location B)*

However health care workers were not mentioned by participants very often in comparison to friends and peers, either as a source of advice or information or in terms of the re-telling of second hand information. So although health workers may be influential their overall input into the discussions on family planning may be low. Most family planning outreach activities are focused around ante-natal services and weighing clinics so never users without children are unlikely to come into regular contact with health workers. As mentioned previously the task of counseling is complicated by the individual and unpredictable nature of most side effects however, where individuals are receiving some sort of counseling on side

effects when they adopt a method it can be very effective at reassuring the women and preventing discontinuation. As one participant stated:

> *'Before I went in for the family planning I was told I was going to experience a few side effects at the beginning but I was to stay focused and forget about the family planning and that it was going to stop. So when I started experiencing these effects I did as I was told and after two months the problems stopped.' (30 or under, ever user, location B)*

3.5: Discussion and Conclusion

Figure 3.6 below shows a diagrammatic summary of the results of this study. The diagram shows that there is a cycle operating whereby information flows around the network and has the potential to influence individual's behaviour. Fear of side effects is created from a combination of direct past personal experience of side effects and/or information from outside sources which also may be influenced by the experience of side effects, which are generally of the expected type and relatively benign from a clinical stand point. While the information flowing through this network may be 'true' it may be atypical of what a contraceptive user may expect given correct and supervised use of a modern method. Therefore this sort of communication cannot be easily dismissed as 'rumor' because it has a basis in fact, even if the negative effect was due to the misuse of a method. Rather than dismissing this sort of information as untrue some way must be found to communicate the relative uncommonness of these events and that there is not necessarily any link between one persons experience and another.

Fear of side effects is a combination of many factors including fear of real and immediate health problems and the potential for social, financial and relationship consequence. Each of these has a sound basis in fact and represents legitimate concerns which need to be resolved if the women is to adopt a modern method. Another set of factors contributing to fear of side effects is effects on future fertility and potential neonatal deaths or still births. These are not likely consequences of modern method use, however they are events which happen frequently in the communities in which these women live. Given no other obvious explanations for these events it is not unreasonable that they might be linked to a perhaps still unfamiliar western medical intervention. Ultimately the results show that the consequences of fear of side effects are non-use or discontinuation of methods and the perpetuation of negative information within the social network.

Figure 3.6: Diagrammatic Representation of Results

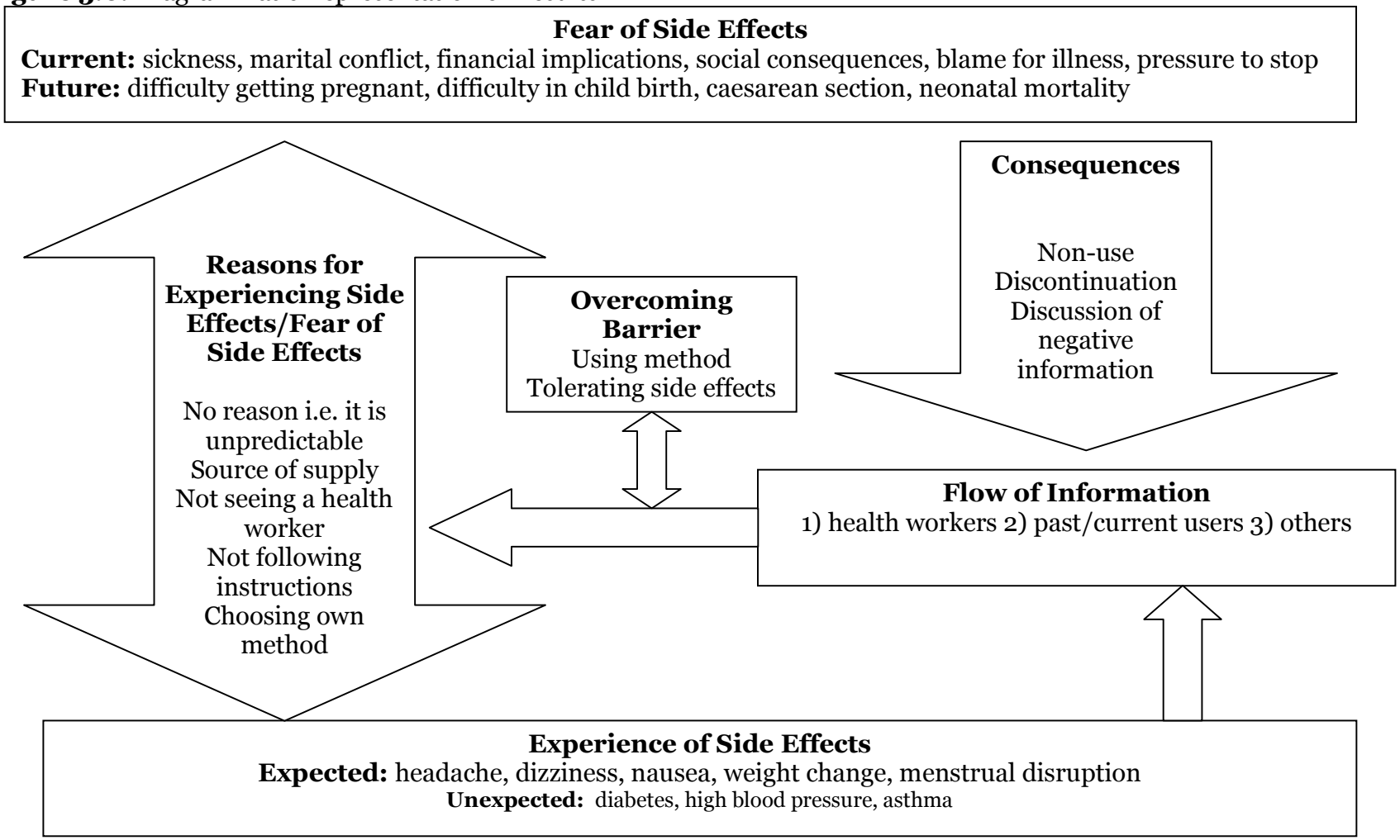


Figure 3.6 does show however that while there is fear and it does act as a barrier to the use of modern methods it is by no means insurmountable and with sufficient motivation fear can be overcome and the negative cycle broken. Once this happens relatively few users will experience serious problems and hopefully be able to contribute positive stories to the flow of information. One way to enhance this is to include successful users in education and counseling activities which is a strategy also suggested by Rutenburg and Watkins (1997). However the result of this study suggests caution must be taken with this approach as publicly disclosing their status in this way may involve some significant psycho-social costs for the women involved.

One factor that may contribute to fears is the often vague and unspecified nature of the side effects in the information being circulated and the uncertainty surrounding exactly what can be expected from each different method. Similar to the Ghana Ministry of Health (1992) study, this study shows that participants are not always able to link a particular effect to a particular method. A positive finding is that the participants in this study clearly identified a number of reasons why individuals might have bad experiences which were not related to method use. This backs up what was found by in India Kirkconnell-Hall et al. (2006) that women know that many problems are arising because methods are being used incorrectly. This also related to the problems of source of supply of methods and lack of counseling on side effects.

The results of this study indicated that the experience of expected side effects may be related to non-clinical source of supply and hence potentially incorrect administration of methods. This is a particularly serious issue in Ghana given that according to the 2003 GDHS 66% percent of pills are obtained from a pharmacy chemist or drug store (Ghana Statistical Service, 2004). Additionally only 30% of those women are likely to receive any

counseling or information at all on side effects at the time they obtain the method compared with over 70% in a public sector health center or clinic.

As well as identifying incorrect use as a source of side effects the participants in this study also clearly stated that symptoms of other illnesses and conditions are often misidentified as side effects. The fact that the participants are so well able to rationalize the information they hear and differentiate unusual situations from the more normal experience of use is a positive step in overcoming their own fear. This does lead to the question of why the fear persists if there are so many rational explanations. The answer to this may lie in the unpredictable nature of side effects. Women know that even if they do everything right they may still experience a side effect and that no-one can accurately predict this. This genuine uncertainty may amplify other concerns and lead to the persistence of fear of side effects as a barrier to use. The best way of overcoming this is through education and counseling from health personnel who are perceived to be very influential sources of information.

3.5.1: Conclusion and Policy Recommendations

There are clear practical and policy implications in understanding how the diffusion process influences reproductive behaviour. Family planning education can then best utilize networks to disseminate information or understand how networks may work as a deterrent to individual contraceptive adoption. Overall the findings of this study show that fear of side effects does act as a significant barrier to the use of temporary methods and especially hormonal methods. These fears result mainly from a large amount of negative information regarding side effects being passed through the social network; but the events being recounted cannot necessarily be dismissed as myth or rumor and are most likely based in real experiences. Those experiences however do not reflect the experience of a typical user but rather cases of incorrect use or of other illnesses being blamed on method

use. Current users are potentially very influential in overcoming fear of side effects and they should be encouraged to participate in education campaigns. This should be done with care to protect each individual and increased education to promote the general acceptability of modern method use will facilitate the use of current users as peer educators.

The study shows that counseling and information is important in overcoming fear of side effects and proper training for health workers and CBDs in this area is vital. In addition a very important but neglected and unregulated source of contraceptives is pharmacies. Widespread availability of methods undoubtedly increases the CPR; however an unintended effect of this is an increase in fear of side effects due to a lack of adequate counseling. More attention to the training of pharmacists to provide counseling on side effects may help to decrease misuse and hence the negative flow of information.

This study shows that with sufficient motivation to avoid pregnancy and adequate counseling the fear of side effects can be overcome and the actual experience of side effects can be tolerated.

Chapter Four

Contraceptive Discontinuation and Side Effects: Longitudinal Evidence from Southern Ghana

4.1: Introduction

When considering the issue of low levels of contraceptive prevalence many studies focus on the socio-economic, cultural and physical barriers women have to overcome in order to adopt a method of contraception. Somewhat less attention is given to what happens after a woman has overcome these barriers and adopted a method. The contraceptive dynamics of discontinuation, switching and failure among users all contribute significantly to the overall contraceptive prevalence rate (CPR) at any given point in time. In many sub-Saharan countries where the CPR has historically been very low and has only recently begun to rise, encouraging contraceptive continuation has been less of a priority than encouraging new adopters.

However the influence of contraceptive discontinuation on fertility will increase as the CPR increases and fertility falls. The effect of discontinuation and failure is even greater on unwanted fertility. In a study of 15 developing countries based on Demographic and Health Survey data Blanc et al. (2002: 132) find that in 14 of those countries 'more than half of recent unwanted fertility was as a result of births that were preceded either by a contraceptive failure or by discontinuation of a method [for reasons other than a desire to get pregnant]'. The study concludes that family planning programs need to pay more attention to improving continuation rates and preventing contraceptive failure as fertility in a given area declines (Blanc et al., 2002).

So while encouraging new adopters of contraceptive methods is undoubtedly important, equally important is continuity of use among current users and

studies are needed to determine the factors associated with contraceptive discontinuation (Parr, 2003). One obvious set of reasons given by women for contraceptive discontinuation is fertility related reasons, principally the desire to get pregnant. Other reasons for discontinuing may include a women reaching menopause or no longer being exposed to the risk of pregnancy for example through a union dissolution or the husband living away. This category of reasons indicates the use of temporary contraceptive methods in their intended way, and does not reflect any areas of concern or necessary area of intervention for family planning service providers. A second category of reasons for discontinuation are method related reasons which include supply side issues such as stock outs or prohibitive costs, method failure and side effects or health concerns. Previous literature has identified side effects or the fear of side effects as an important factor in the discontinuation of methods, particularly modern hormonal methods, (Ali & Cleland, 1995; Ali & Cleland, 1999; Curtis & Blanc, 1997) and side effects may also work to shorten the duration of use of methods or influence method choice away from the high efficacy modern methods. Additionally past negative experiences with a method may influence the future contraceptive behaviour of users. It is this issue of the link between side effects and contraceptive behaviour which is the focus of this study.

This study is situated in Ghana, West Africa and uses data from the Cape Coast Social Learning, Social Influence and Fertility Control Survey (CCFCS) to explore the issue of contraceptive discontinuation and side effects. Fear of side effects has been shown to be a particular barrier to adoption of a method in Ghana and according to the 2003 Demographic and Health Survey (GDHS), was the most commonly cited reason for non-use of modern contraceptives among women who are not currently using contraception and say they do not intend to do so in the future. In total, fear of side effects is 25.6% of women's main reason for not intending to use contraception. The overall contraceptive prevalence rate (CPR) remains relatively low at 18.7% for modern method use among currently married women aged 15-49 in 2003

(Ghana Statistical Service, 2004). Women who used contraception in the past but are not currently doing so are becoming an increasingly important component of contraceptive nonusers in Ghana and lack of continuity of use is a significant explanatory factor for the still only modest CPR (Parr, 2003). There is also evidence of high levels of unmet need for contraception in Ghana. Using data from the 2003 Ghana Demographic and Health Survey (GDHS) Khan et al. (2007) showed that 22% of currently married women who want to delay further childbearing for two years or more and 12% who want to stop further childbearing were not using a method of contraception at the time of the survey. The same study also provides evidence of high discontinuation rates in Ghana. The study calculated the lifetime discontinuation rate for 18 sub-Saharan African countries and found that the percentage of currently married women who had used a method of contraception in the past but were not using a method at the time of the 2003 GDHS survey was 54%. This was the 9th highest discontinuation rate out of the 18 sub-Saharan African countries included in the study (Khan et al., 2007).

Another study, based on 1998 GDHS data, found that 43% of users of any contraceptive method have discontinued the method within 12 months (Parr, 2003). Clinical evidence shows that physical side effects are mainly associated with modern hormonal methods, particularly the pill, injectable, implant, and hormone releasing IUD (WHO & CCP, 2007). The classification of side effects in this study is slightly broader than physical side effects only and also allows for psycho-social effects such as loss of sexual pleasure and marital disruption. However, these side effects are relatively rarely reported and as such this study will primarily focus on modern hormonal methods. Within this the focus will be mainly on pill and injectable use given the small number of users of other modern hormonal methods in Ghana.

4.1.2: Data and Methods

This study has used both the calendar and panel portions of the CCFCS to identify episodes of contraceptive use and attach relevant covariates for study. The CCFCS is a longitudinal household survey conducted in Southern Ghana between 1998 and 2003. The survey was conducted in six study communities, two in each of the Central, Western and Greater Accra regions of Southern Ghana. The target population for the survey was all women aged 18 to 50 at the time of the round one interview along with the male partners of those women who are in formal unions. Respondents were followed from one round to the next and the majority of respondents were observed for between 56 and 60 months (Aglobitse & Casterline, 2005). A total of 1409 women were interviewed at round one along with 908 male partners. 1032 of those respondents were interviewed over seven rounds of the survey. The sample for the analysis of contraceptive use is restricted to women currently in union which restricts the round one sample to roughly 900 individuals.

This study does not use the individual as the unit of analysis but rather episodes of contraceptive use are extracted from the calendar data and these form the basic unit of analysis. In addition discrete time event history analysis is conducted which treats the person-period, in this case women-month of method use, as the basic unit of analysis. Each episode of use which is captured in full within the study period is classified as ending in either a discontinuation or switch. The remaining episodes are those in which the method was still being used at the end of the study period and these episodes are considered to be right censored. Full details of the structure of the data set constructed are given in section 4.3.2. The resulting data set is analyzed first using single decrement life tables to study discontinuation rates and duration of episodes, and secondly using multilevel multiple logistic regression to determine the significant predictors of discontinuation. A multilevel model is used to control for correlation

between episodes caused by the fact that a woman can contribute more than one episode to the dataset.

4.1.3: Aims of study

The overall aim of this study is to examine the pattern, timing and frequency of contraceptive discontinuation and switching and how these relate to the concurrent self-reported experience of side effects. Using the methods described above this study aims to explore the data in three key areas:

1) *The experience of side effects*
   Monthly information is collected on whether or not side effects were experienced in a given month and if so what those side effects were. The calendar allows for the concurrent reporting of up to 3 different side effects. This data is used to investigate the proportion of episodes of use in which side effects are experienced, and the type, duration and intensity of those side effects by method. Background characteristics from the panel interviews are also explored to determine if there are any differences between those who experience a side effect and those who do not.
2) *The effect of side effects on episode length*
   The average length of episode by method is calculated and the effect of experiencing side effects on the length of episodes determined. It is hypothesized that where side effects are experienced the average episode length will be shorter than where they are not. The effect of different types of side effect on episode length is also investigated.
3) *The response to side effects and the predictors of discontinuation*
   The conceptual framework of this study highlights three outcomes of an episode of contraceptive use, either the method is discontinued, the user switches to another method or the episode continues beyond the end of the study period. This study aims to establish if the experience of side effects is a significant predictor of discontinuation or

switching. The study will also control for socio-economic, motivational and experiential variables.

4.1.4: Conceptual framework

Figure 4.1 is a diagrammatic representation of the conceptual framework of contraceptive use dynamics and side effects on which this study is based. The figure shows the process of and episode of contraceptive use as it happens through time, which is divided into three stages. First, at time 1 an individual makes the decision to use a particular contraceptive method and an episode of use begins. This decision, including the choice of method, is influenced by a number of factors both external to the individual such as supply environment, and individual characteristics such as the motivation to avoid pregnancy, stage of the life cycle and past experience with contraceptives. Once the episode has begun the user either does or does not experience any side effects of their method. Time 2 represents the length of the episode which, in the case of this study, can be anywhere from 2 to 60 months long. The line between time 2 and time 3 represents the decision of the user to either discontinue their method or to switch to a different method. Again numerous factors may influence this decision and the central aim of this study is to determine if the experience of side effects is a significant determinate.

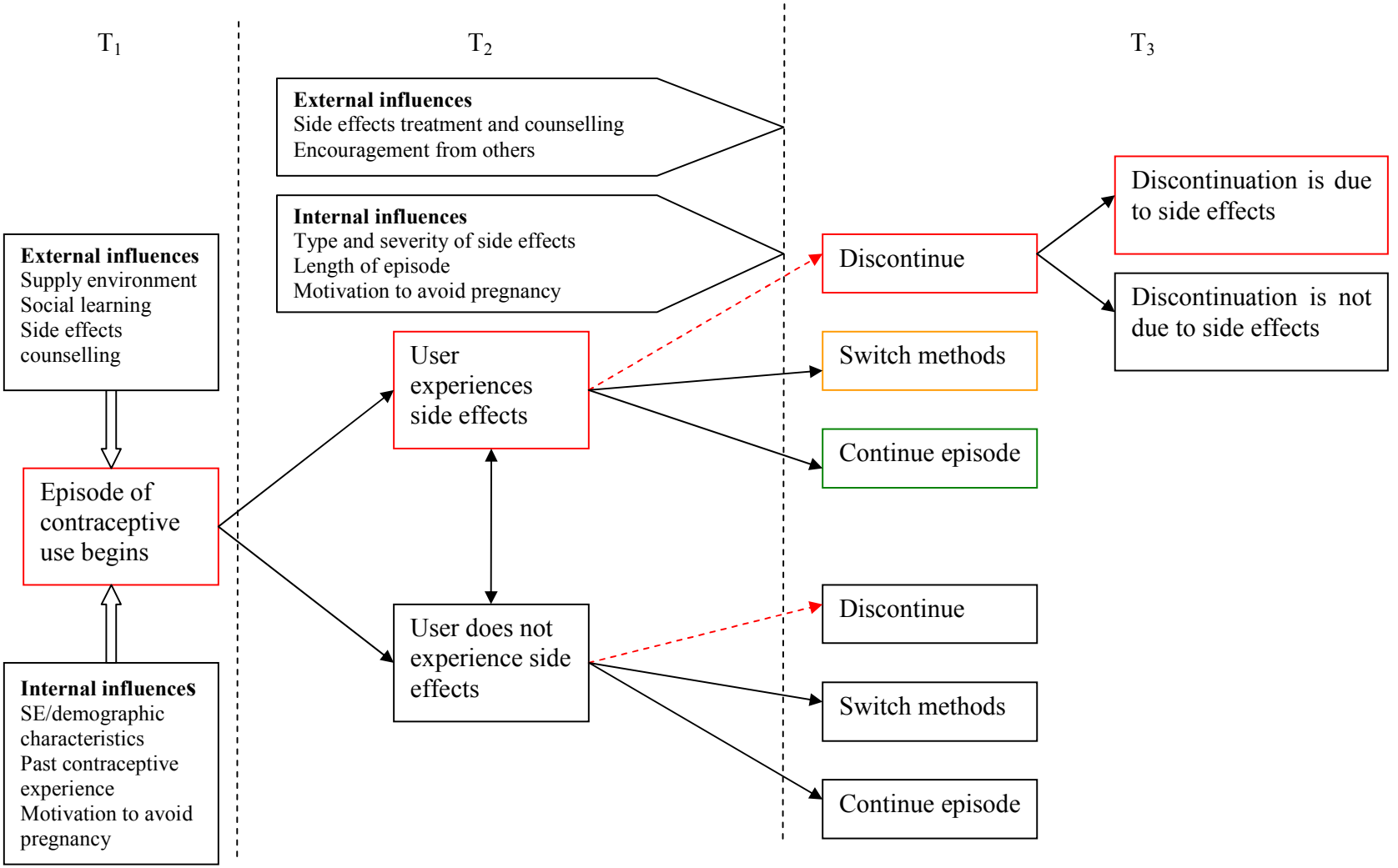
Time three represents the ultimate state of the user once the episode of contraception is over, in the case of this study this may mean that the episode did not finish within the study period and the episode has ended by being right censored. For those individuals who switch methods they are immediately returned to time 1 and the cycle begins again. For those who discontinue then at any time after time 3 they may either decide to begin a new episode of use and return to the beginning of the cycle or they may remain a non-user. Each individual may complete this cycle of periods of use and non-use multiple times and may take similar or contrasting pathways

each time. As mentioned in the introduction the unit of analysis in this study is the individual episode, so only one cycle at a time through this pathway is considered in this study and periods of non-use between cycles are not included.

4.1.5 Structure of Study

This chapter is presented in 5 sections; the introduction has established the background and aims of the study and considered the theoretical framework within which it is situated. Section 2 gives an overview of some of the relevant literature and highlights the key issues related to contraceptive discontinuation and side effects. Section 3 gives details about the data and methods, beginning with a description of the collection and design of the original data set. The process of creating the dataset used for this analysis is then described along with the methodology used and the limitations of the study. Results are presented in 3 sub-sections, first descriptive results, then results of the life table analysis and finally results of the multilevel logistic regression. The chapter is concluded by discussion and conclusions, including policy implications.

Figure 4.1: Conceptual Framework of Contraceptive Use Dynamics



4.2: Previous Studies

There are many studies on contraceptive dynamics which have identified side effects as an important reason for discontinuation. For example a study by Cleland and Ali (1995) looked at discontinuation in six developing countries with relatively high CPR. This study was based on analysis of DHS contraceptive history calendar data and found that of all episodes of use one third had ended within the first 12 months and half within 24 months. The reasons given for discontinuation varied by method, with episodes of hormonal contraceptive and IUD use most often ending due to side effects while traditional methods most often ended in method failure and accidental pregnancy. Overall "health concerns, including side effects, were the most common cause of discontinuation. For all methods combined about 10% of episodes were terminated within the first year for this reason and about 20% were ended within two years" (Ali & Cleland, 1995: 96).

In another study that used DHS calendar data for cross country comparisons Blanc, Curtis and Croft (2002) studied calendar data from 15 countries and concluded that health concerns and side effects account for the majority of all method discontinuations in most countries. This study found that discontinuations reportedly due to side effects were most prevalent among injections users where discontinuations before 12 months of use for this reason amount to greater than 50% of discontinuations in all but 2 of the 15 countries. For pill users the numbers are more variable across countries with between 34% and 64% of discontinuations before 12 months being side effect related.

Similar results were found in a study which also looked at contraceptive dynamics in 6 countries using DHS calendar data[5] (Blanc & Curtis, 1997). In

[5] Cleland & Ali's 1995 study included Ecuador, Egypt, Indonesia, Morocco, Thailand and Tunisia. Blanc and Curtis 1997 studied Bangladesh, Colombia, Egypt, Indonesia, Peru, and Zimbabwe. Therefore two countries (Egypt and Indonesia) were common to both studies.

this study discontinuing due to side effects or health concerns was classified, along with other reasons for discontinuation,[6] as abandoning a method while still in need of contraception. The study found that overall almost half of users in Egypt, Indonesia and Zimbabwe had discontinued by 24 months and this rose to approximately two thirds in Bangladesh, Colombia and Peru. Much of this discontinuation reflected failure, switching or abandonment due to reduced need, however abandonment while still in need was found to be relatively common. Method choice was found to be strongly associated with the risk of abandonment while still in need and this risk was shown to be significantly higher for users of modern methods compared to users of traditional methods.

More recently Bradley et al. (2009) conducted a comprehensive study of eight countries in which two consecutive DHS have collected contraceptive calendar data[7]. This study was similar to that by Blanc and Curtis in the way in which it specified the different types of discontinuation, with discontinuation due to side effects being classified as 'in-need discontinuation'. When examining the reasons for discontinuation this study found that the percentage of discontinuations due to side effects ranged from 2% in Armenia to 37% in Egypt. This disparity is explained by the specific method mix in each country with Armenians relying predominantly on withdrawal which, although it has a high failure rate, has very low incidence of reported side effects. Using the two consecutive DHS the study was able to look at the reasons for discontinuation over time and found that in all countries except Kenya discontinuations due to side effects had either decreased or remained roughly the same. In Kenya the proportions of discontinuations due to side effects in 1998 was 21% and this increased to 29% in 2003 (Bradley et al., 2009: 29). This rise has lead to an overall

[6] Husband's disapproval, health concerns, access/availability, desire for a more effective method, inconvenience of use, a fatalistic attitude, cost, other unspecified reasons, and 'don't know'.

[7] Countries studied are Kenya, Zimbabwe, Armenia, Egypt, Bangladesh, Indonesia, Colombia and the Dominican Republic.

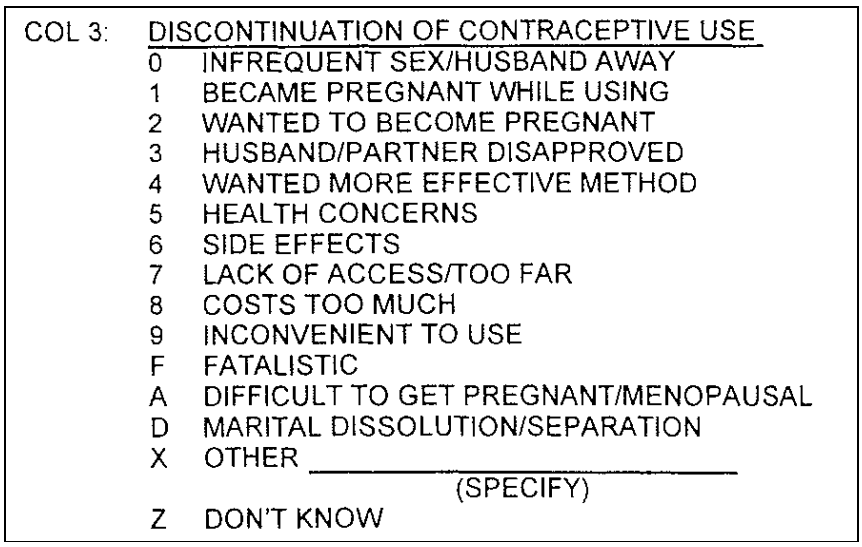
increase of the 'in need' discontinuation rate in Kenya from 17% to 26% of users of all methods. Looking at 12 month discontinuation rates by method the study found that over 15% of pill users (in every country except Zimbabwe and Indonesia) discontinued due to side effects within one year. In Egypt, Bangladesh, Colombia, and the Dominican Republic between 23% and 37% of injectable users discontinue due to health concerns or side effects in the first 12 months. In Kenya injectable discontinuation due to side effects also increased between surveys from 12% to 20%. When controlling for other factors in a multivariate model the study found that the probability of abandoning pills while 'in need' was higher than for any other reason in Kenya, Egypt, and the Dominican Republic. The same was true of injectable use in Kenya, Zimbabwe, Egypt, and the Dominican Republic. The study concluded that abandonment of pill or injectable while in need is more common than either failure or switching and the primary reason both types of user discontinue while in need is health concerns or side effects (Bradley et al., 2009).

Along with the multiple country DHS based studies already discussed there are also many similar studies published which use DHS data to focus on the contraceptive dynamics of a single country. Blanc and Curtis (1997: 2) provide a useful review of the 12 month discontinuation rates by reason for discontinuation found by 10 different studies each based on a single country DHS. As new DHS continue to be conducted so new studies are undertaken to take advantage of the up to date data (see for example Fathonah, 2000; Leite & Gupta, 2007 & Laguna et al., 2000; Sambisa, 1996 & Mitra & Al-Sabir, 1996). These studies all identify side effects as a significant cause, to one degree or another, of method discontinuation and as an issue which is particularly pertinent to pill and injection users.

All of the studies discussed so far use the calendar portion of the DHS as the basis for analysis but this data does present some limitations. The DHS calendar collects monthly information on contraceptive use or non-use,

pregnancy, and pregnancy outcomes retrospectively for five years prior to the date of survey. The calendar also records the respondents stated reason for discontinuation in any month in which they end a period of continuous use of a particular method of contraception. The extended calendar which collected reason for discontinuation was part of the model A core questionnaire from phase II beginning in 1988 through phase IV ending in 2003. The reasons for discontinuation recorded by the calendar are shown in Figure 4.2.

Figure 4.2: Reasons for Discontinuation from DHS Contraceptive Calendar


COL 3: DISCONTINUATION OF CONTRACEPTIVE USE

0 INFREQUENT SEX/HUSBAND AWAY
1 BECAME PREGNANT WHILE USING
2 WANTED TO BECOME PREGNANT
3 HUSBAND/PARTNER DISAPPROVED
4 WANTED MORE EFFECTIVE METHOD
5 HEALTH CONCERNS
6 SIDE EFFECTS
7 LACK OF ACCESS/TOO FAR
8 COSTS TOO MUCH
9 INCONVENIENT TO USE
F FATALISTIC
A DIFFICULT TO GET PREGNANT/MENOPAUSAL
D MARITAL DISSOLUTION/SEPARATION
X OTHER _____ (SPECIFY)
Z DON'T KNOW

Source: (ORC Macro, 2001: 101)

The major limitation of this data source is that it is only available for countries implementing the model A core questionnaire which are considered high contraceptive prevalence countries. Therefore calendar data for countries in sub-Saharan Africa is generally limited, and Ghana which is the focus of this study has not collected extended contraceptive calendar data. Additionally the calendar suffers problems of recall bias, due to the long recall period, and consequently can display serious heaping of data onto 6 or 12 month intervals (Bradley et al., 2009; Blanc & Curtis, 1997). A study

of two overlapping DHS surveys in Morocco compared the reported current contraceptive use from one survey with the reported use in the same month gained from calendar data collected three years later (Strickler et al. 1997). The results show that there are some discrepancies in the reporting at the individual level but at the aggregate level generally the data was reasonably matched. It was also determined that individual reporting errors were randomly distributed. Interestingly the study also found that the indicator that was least reliable was the reason for discontinuing. This may reflect other author's observations that a further limitation of the DHS calendar is that it only allows for the recording of one reason for discontinuation when in fact this is likely to be either a complex and multidimensional decision to stop using or a passive (non)decision not to obtain further supplies (Ali & Cleland, 1995).

As mentioned GDHS has not collected contraceptive calendar data but it has been possible to calculate discontinuation rates by method using questions asked to ever users about their last episode of use. Parr (2003) used the GDHS 1998 to determine episode duration and explore current reasons for non-use amongst former contraceptive users. The study determined that median episode duration for all methods was 12.6 months, 12.2 months for episodes of pill use rising to 19.6 months for injectable episodes. The 12 month discontinuation rate was 43% overall or 47% for pill users and 29% for injectable users. As reason for discontinuation of episode was not collected in this survey the study looked at the reason for current non-use among former users. Across former users of all methods 14.4% stated they were not currently using due to health related fears but this was significantly more at 20.7% and 26.2% for former pill and injectable users respectively. This is the largest percentage reporting any single reason for non-use among former injectable users and the second largest for former pill users with the only the percentage citing a recent pregnancy as reason for non-use being higher. It was also found that when comparing reasons for non-use between former users and never users, former users were somewhat more likely to

state heath fears. This result raises the possibility that former users have experienced difficulties with methods which have contributed to an increase in their concerns over side effects.

Along with the life table type estimates of discontinuation rates and duration of use many studies have also employed multivariate analysis in order to determine the socio-economic or demography predictors of discontinuation. As is suggested by the results previously discussed type of method used is the most significant and consistent predictor of discontinuation, with women being more likely on average to abandon modern methods than traditional ones (Bradley et al., 2009: 29). When examining duration of use it seems that highly effective hormonal methods are used for no longer than traditional methods because the 'high rates of method failure for the latter are offset by high rates of discontinuation of hormonal methods because of side-effects and health concerns' (Ali & Cleland, 1999: 351). Age is another characteristic frequently found to be significantly associated with the probability of discontinuation. In general younger women are found to be more likely to discontinue than older women, however the strength of this association can vary according to method (Bradley et al., 2009; Leite & Gupta, 2007; Ali & Cleland, 1999).

The picture is less clear with other socio-economic characteristics where there are not always clear associations and results often vary between studies. Education level is one variable which has been found by some studies not to be a significant predictor of discontinuation or duration of use, despite the strength of the relationship between education and the initial adoption of methods. Similarly residence in urban as opposed to rural areas is a strong predictor of current use but is found not to predict discontinuation in many studies (Ali & Cleland,1995; Leite & Gupta, 2007), while in others it is found that urban women are more likely to discontinue than rural women (Porter, 1984). This is unexpected given that supply issues are assumed to be responsible for at least some discontinuation and supplies

issues are most sever in rural areas. Cotton et al. (1992: 147) summed up this subject by stating that their ambiguous results 'might indicate that service providers cannot use social or demographic characteristics to predict whether clients are at higher risk for discontinuation'.

Motivational factors and fertility intentions have been shown to be associated with discontinuation. Ali and Cleland found that couples who want no more children (i.e. who are using a contraceptive method for limiting) are less likely to discontinue than those who have not reached their desired family size and are using a method to space their births. They suggest that with sufficient motivation to avoid pregnancy 'the inclination to cease use because of side-effects or health concerns' can be overcome (Ali & Cleland, 1999: 360). Tolley et al (2005) find the same result and suggest that fertility intentions influence tolerance for menstrual side effects. An area which warrants further investigation is the effect of prior experience of a method on the likelihood of discontinuation of a current episode. Ali & Cleland (1999) hypothesize that prior experience may lead to prolonged duration of current use given that some methods demand a certain degree of skill from the user. Their findings show that prior use is a predictor of discontinuation for condoms and pills but less so for injectables and not at all for traditional methods, which could be considered the most demanding of the user. This is an area to be explored in this study with the proposal that rather than skill per se, what prior use is contributing is knowledge of potential side effects and their likely effect on each particular individual.

Another area of particular interest in this study is discussion and communication about family planning and its effects on episodes of use. It has been well established in many studies that communication about family planning encourages method adoption (Bawah, 2002; Hornik& McAnany, 2001; Westoff & Bankole, 1997). For example a study using longitudinal data in Northern Ghana found that women who have been encouraged by their peers are almost three times as likely to subsequently adopt a method as

those who have not been encouraged, and this rises to four times as likely when the encouragement comes from a health worker (Feyisetan, et al. 2003). The findings suggest that the majority of communication between spouses or friends in a close network was favourable and 'unfavourable communication may travel through less close networks' (Feyisetan, et al. 2003: 24). This is especially interesting given that in a study of discontinuation Porter (1984) found that discontinuation was significantly influenced by unfavourable communication from trusted sources or sources with expertise (past or current users). Communication of any type from unidentified sources (i.e. rumours) was found not to be a significant factor in discontinuation. This suggests that unfavourable communication within close networks is less common but significantly more influential than encouragement or discouragement from less close networks. There are currently no studies investigating the effect of this encouragement or discouragement to continue a method in the face of the experience of side effects.

The studies of contraceptive discontinuation discussed so far provide useful information on discontinuation rates, duration of episodes and stated reasons for discontinuation. However the major weakness of this type of study is that although a woman may give side effects as her reason for discontinuation the data does not reveal any information at all about the actual experience of side effects which caused her to discontinue. Additionally nothing is known about individuals who experience side effects but continue to persist with the method. There have been a number of smaller scale studies which employ calendar techniques to shed light on the actual experience of contraceptive users. It is worth noting at this stage that there is an extremely extensive body of clinical trial literature relating to contraceptive methods and their side effects which is not being discussed in this study. Clinical trial data may deal with the purely physical experience of side effects but it does not tell us anything about the perception of the individual, the social context of the situation or the behaviour of the

individual in relation to the side effect. Additionally, as pointed out by Tolley et al. (2005), clinical trials only focus on one method at a time making it difficult to compare different experiences with different methods. For these reasons the clinical literature is not reviewed here.

Two clinic based prospective studies of new users in The Gambia and Niger followed clients for between 6 and 8 months from the time of adoption. Methods used were pill, injection, IUD and barrier methods and, after adjustment for loss to follow up, between 67% and 68% of respondents were still using at the end of the study, including 10% who had switched methods. Side effects or fear of side effects was the most common reason for discontinuation in both countries, and was the only reason spontaneously mentioned by the respondents (Cotton et al, 1992). Respondents were asked to report whether they had experienced any adverse health effects such as excessive bleeding, abdominal pain, nausea or headache in the previous month. Overall most respondents had not experienced any adverse health effects. In Niger 50% of IUD users reported pelvic pain and 20% of injectable users experienced headaches, while in The Gambia 14% of IUD users and12% of pill users experienced abdominal pain. Additionally 15% of IUD users and 8% of injectable users experienced dizziness (Cotton et al., 1992).

One type of side effects which does not receive much attention in the clinical literature is menstrual disruption. This is considered to be a clinically benign side effect and therefore can often be minimized or dismissed by health personal (Tolley et al., 2005). However the effect on the individual user can be serious and studies show that many women have a low tolerance for menstrual changes and this is a major reason for discontinuation (Datey et al., 1995). The methods which are most likely to cause menstrual disruption are, hormonal methods, in particular injectables and implants which both cause unpredictable changes, and IUD which causes on average slightly longer bleeding. Many women will experience a decrease in bleeding as a result of hormonal method use and medical findings suggest that overall less

bleeding has a positive effect on women's health. However these sorts of findings do not always "resonate with users" and this kind of menstrual disruption can still be a cause for discontinuation (Tolley et al., 2005: 21).

One of the difficulties in dealing with this particular side effect is that the effects themselves, along with the level of tolerance for those effects, will vary from women to women (Tolley et al., 2005). In a study of IUD, implant and injectable users in Egypt, Tolley et al. (2005) found that 72% of users reported noticing menstrual changes in the first two months of use but only 26% were worried about it. However after 18 months follow up of new users 40% of discontinuers were found to have cited heavy or long bleeding as the main reason for discontinuation and bleeding length was a significant predictor of discontinuation of all methods in a multivariate model. The study came to the conclusion that it is women's perception of their menstrual cycle which influences tolerance of menstrual changes rather than actual changes in menstruation (Tolley et al., 2005). A study in India found similar results using 90 day menstrual diaries which showed that only 20-30% of implant users, 30-35% of injectable users and 37% of hormonal IUD users experienced what they considered to be normal menstruation (Datey et al., 1995). These results suggest that while the reporting of side effects is shown by some studies to be relatively uncommon the occurrence of menstrual disruption is in fact very frequent. However, each individual will have a varying perception and tolerance of this side effect and many may not consider it to be worrying and hence not report it as a side effect.

Besides the important relationship between side effects and method discontinuation for the overall CPR, the response to side effects can also be seen as an indicator of quality of a family planning program and its service provision (Blanc et al., 2002). Ali and Cleland point out that "although willingness to persevere with a method does not necessarily imply satisfaction, high discontinuation rates are usually a sign of discontent with the method or the service" (Ali & Cleland, 1995: 92). Tolley et al. (2005)

found that as a main effect counselling, or lack of counselling, did not predict discontinuation, which they felt raised questions about the content and quality of counselling on side effects. As mentioned above some side effects, particularly menstrual changes, are unpredictable and vary considerably from women to women. This uncertainty makes counselling on side effects a complicated task and more information on the potential for different side effects is not necessarily better. Tolley et al. (2005) found for instance that when being counselled regarding side effects users who were told they might not bleed became anxious when they did and vice versa. Cotton et al, (1992) also raised doubts about the quality of counselling and concluded that discontinuation was greatest among people who said they had not been adequately counselled on side effects and better staff training could increase client satisfaction.

4.3: Data and Research Methods

This chapter begins by describing the CCFCS study including a brief overview of the sample design, study location and response rates. Then the chapter describes the creation of the dataset used for this analysis by extracting information from the calendar data file and merging it with covariate information extracted from the panel surveys. The issues of episode censoring, and data quality are also addressed. Each variable used in the multivariate modelling and its' derivation is then described and finally the statistical methods used in the analysis and the limitations of the study are explained.

4.3.1: Cape Coast Social Learning, Social Influence and Fertility Control Survey

This paper analyses data from the Cape Coast Social Learning, Social Influence and Fertility Control Survey (CCFCS). This is a longitudinal survey of women aged 18 to 50 at the time of the first interview which was conducted in six locations in Southern Ghana. The study consisted of eight rounds of data collection between October 1998 and November 2003. A total of 1409 women were interviewed at round 1 along with 908 male partners. Questions regarding contraceptive use were only asked to women currently in union so that restricted the sample available for this study to roughly 900. Respondents were followed from one round to the next and the majority of respondents were observed for between 56 and 60 months (Aglobitse & Casterline, 2005). At each round of the panel interview, beginning at round 2, women were asked to provide monthly calendar data going back from the current month of interview to the month of the previous interview. The calendar collected monthly information on:

- Marital status
- If husband is present in home
- Pregnancy status (and pregnancy outcome)
- Breastfeed status
- Abstinence status
- Contraceptive method (up to four methods simultaneously)
- Experience of side effects (up to four different side effects simultaneously)
- Advice given from a health worker (up to four answers simultaneously)

The core questionnaire deployed at each round also contains information on social interaction specific to family planning and standard socio-economic and demographic background variables.

4.3.1.1: Study Communities

The CCFCS was conducted in six study communities, two in each of the Central, Western and Greater Accra regions of Southern Ghana. The six communities are isolated from each other and were purposively selected to provide maximum heterogeneity in terms of ecological setting, economic activity, ethnicity, and kinship system (Casterline, 2007). Information on some of these factors for each community is summarized in Table 4.1.

Table 4.1: Summary of Information on the Six Study Communities of the CCFCS

Study areas	Location	Region	Primary economic activity	Primary ethnic/language group	Primary religious affiliation
1	Coastal	Western	Fishing	Fante	Pentecostal
2	Inland	Western	Farming	Fante	Pentecostal
3	Inland	Greater Accra	Trading	Ga-Adangbe	Pentecostal
4	Inland	Greater Accra	Farming	Ga-Adangbe	Muslim
5	Coastal	Central	Farming, Fishing	Fante	Christian
6	Inland	Central	Farming	Denkyira/Twi	Christian

Table 4.1 conceals further variation between communities, for example communities 2 and 6 are both primarily devoted to subsistence farming whereas communities 4 and 5 engage in farming for cash crops. There is also considerable variation in wealth status which, using mean number of household possessions as a proxy, varies from 2.7 in community 6 to 5.0 in community 3. Roughly the same percentage of households is electrified in each of the six communities, ranging from 71% to 88%. About half of the sample are Fante, which is as expected, since that is the dominant ethnic group in this part of Ghana. Also represented are Denkyira, Ga, and Adangbe, with Ewe and Ahanta also distinguishable. The primary lineage type follows from the ethnic composition, with the four communities dominated by Akan-speaking groups (Fante and Denkyira) being matrilineal and the other two communities being patrilineal (Casterline, 2007). All of the communities are in rural locations with the exception of community 3 which can be considered peri-urban.

4.3.1.2: Sample Design

The initial sample was drawn based on a household census which enumerated every household and all eligible women within each household. The sample selection varied across communities based on population size and geographic dispersion. In the 4 smaller communities all eligible women were selected and in the two larger communities participants were selected by simple random sampling from the household census data.

The panel survey sample was monitored via an Access data-base that was developed at the Population Council in New York and maintained by project staff at the University of Cape Coast. This data-base contains an entry for each person eligible for interview at any time during the multiple rounds of the panel survey, with further indication of his/her round-by-round status (successfully interviewed, etc.). Each respondent has a unique identification code that is maintained throughout the study.

4.3.1.3: Response Rates and Attrition

Response rates range from a low of 84% in community 3 in round one to highs of 99% in some areas for some rounds. The overall average response rate was 95%. At each round every effort was made to interview all eligible respondents and as a general rule three attempts were made to locate, schedule and/or conduct an interview. This process was aided by the fact that most of the interviewers lived in the study communities. Overall sample retention was excellent with about 85 percent of women remaining in the sample from Round 1 to Round 8. This is particularly exceptional in the West African setting where rates of residential and circular mobility are high (Casterline, 2007).

In order to maintain the sample, persons who were eligible in the previous round but were not interviewed were involved in a 're-capture interview'. Respondents were administered a questionnaire, labelled a "hybrid" questionnaire, that blended items from the previous and current rounds' questionnaires. In round 2 an additional 209 women were added to the sample who were either non-response at round 1 or were women who had moved to the study community since round 1 and were deemed eligible for the study. These respondents were administered the full questionnaires for both rounds 1 and 2. No women were added to the sample after round 2. Women missed in two consecutive rounds were deemed too difficult to trace and were dropped.

4.3.2: Creation of Study Dataset

The dataset used for this study was created out of the CCFCS by combining elements of both the calendar and panel portions of the data. The calendar portion of the data contains information on 1364 individuals and amounts to more than 78,000 woman-months of observation. The dataset used for this analysis was created by extracting episodes of contraceptive use, which form the units of analysis for this study, from the calendar data. The calendar is a person-month file containing observations for every individual for every month that they were observed.

This study uses a discrete time event history approach to modelling partly due to the fact that the data was collected in the discrete time interval of months. Use of month as the temporal unit has one major weakness, in that it is assumed a women can only experience one state per month, implying that only one event can be experienced per time period. So for example if a couple used a condom and then began taking the injection in the same month then it is not always clear which code has been inputted in the corresponding month of the calendar. This can result in the duration of episode being biased in favour of particular methods (Steel et al, 1996). The

CCFCS tries to overcome this by recording pregnancy status, breastfeeding status and contraceptive use in different columns. In addition there are four columns for contraceptive use status to be recorded so up to four simultaneous methods could be captured. This is a clear improvement on the DHS style calendar, which allows for only one record per month; however for the purposes of analysis this detailed data has to be collapsed back into one method per month. The obvious advantage of this is that rather than being based on the discretion of the field worker the choice regarding which method is recorded as the primary method is entirely in the control of the researcher.

The basic approach is to follow a hierarchy of method effectiveness and where more than one method is recorded the method considered to have the greatest efficacy is chosen. Hamil et al. (1990) conducted a study that concluded that this approach did not result in significant bias as the combined efficacy of multiple methods approximates that of the most effective one. A full explanation of this process is included in Appendix 4A. This does have implications for the results of this study in terms of the prevalence of side effects, as the most effective methods are the hormonal methods which are also the most likely to have side effects. When the side effects were originally recorded in the calendar the side effect for each month was not linked in any way to the method for that month so after the collapsing of the methods data the side effect will then be attributed to whichever method was the most effective, even if it was actually caused by another less effective concurrent method. This will not affect estimates of the overall incidence of side effects; however it may affect somewhat the proportion of side effects which is attributed to each method. It is not felt that this is a serious problem given that the two most effective methods, pill and injectable, are also the most likely to cause side effects and are unlikely to be taken together.

An episode of contraceptive use is defined as the continuous use of the same method reported for a period of 2 consecutive months or more. Discrete-time hazard models estimate the probability of an event during time t given that the event did not happen in a previous time period. Therefore if an adoption and discontinuation both happened in month 1 it would not have been possible for any event to have occurred in the previous time interval. The first step in creating the dataset for analysis was to remove individuals who were either not married or non-users in every month throughout the entire observation period. In addition months representing months of use of female sterilization[8] were removed. Event history modelling estimates the time to event on the basis of the length of time 'at risk'. Users of sterilization are not at risk of contraceptive discontinuation (although there may be a very small chance of a contraceptive failure) therefore they are excluded from the dataset. Finally each episode of use was identified and two new data files created. One file is in episode format where one case represents each episode, in which case the time varying calendar information is simplified into one data point. The other file is in person-period format with each case representing one woman-month of use, and the calendar data intact. Examples of each type of data structure are shown in Appendix 4B.

4.3.2.1: Censoring

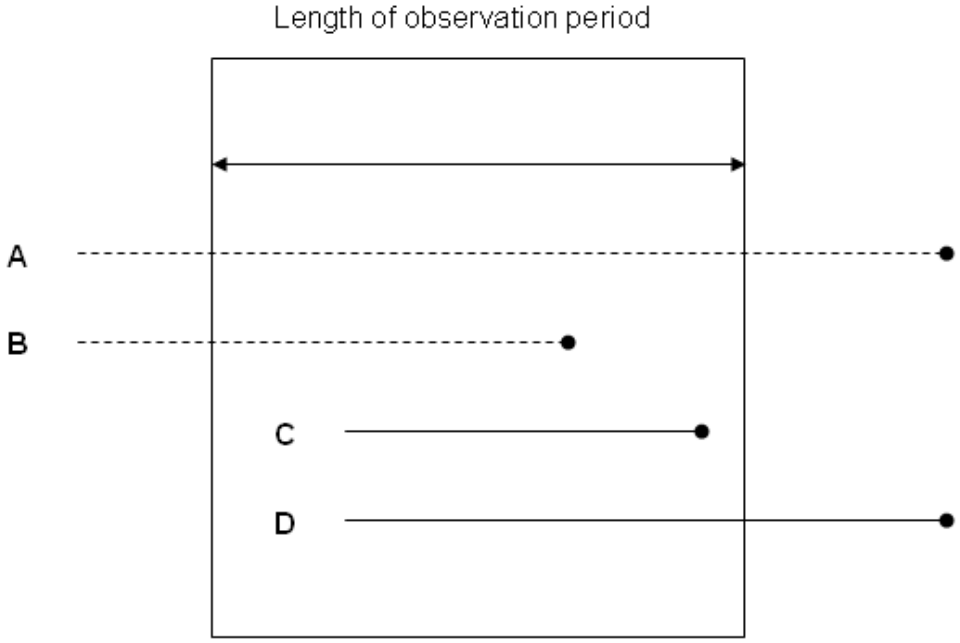
Where calendar data is collected retrospectively each episode of use identified in the data may not be captured in its entirety within the period of observation. Figure 4.3 below is a schematic representation of the four possible scenarios into which each identified episode may fall. The four scenarios are:

[8] There were no recorded episodes of male sterilization in the calendar data.

A = an episode of use beginning at an unknown period before the start of the observation period and ending at an unknown time after the end of the observation period. This type of episode is excluded from the dataset due to the left censoring.
B = an episode of use beginning at an unknown period before the start of the observation period and ending at a known time within the observation period. This type of episode is excluded from the dataset due to the left censoring.
C = an episode both beginning and ending at known times within the observation period. This type of episode is included in the dataset and the ending is classified as either a switch or a discontinuation.
D = an episode beginning at a known time during the observation period but ending at an unknown time after the end of the observation period. This type of episode is included in the dataset. The episode is considered to have continued and is coded as ending in right censoring at the time the study period ended.

Episodes which fall under scenarios A and B are considered left censored (or left truncated). These observations cannot be included in the dataset given that the duration of the episode is unknown due to the unknown start date. Additionally inclusion of episodes that started prior to the period covered by the data may introduce a selection bias against long episodes (Ali & Cleland, 1999). The duration of episodes of type D, right censored episodes, is also unknown however these observations can be used. What is known is that the episode lasted at least a certain duration of time up until the point that the observation period ended. So whilst no event is observed this episode can still be included in the denominator and contribute information to the models.

Figure 4.3: Schematic Representation of Episode Censoring



4.3.2.2: Inclusion of Covariate Information

One major limitation of the DHS calendar is that it suffers from a lack of covariate information given that the calendar is collected retrospectively from the date of interview. This means that a lot of the information in the interview itself cannot be related back to episodes in the calendar as those characteristics refer to a period earlier in time. The Cape Coast data solves this by collecting the calendar data retrospectively from the date of interview but beginning in the second wave. Therefore each episode of use can be matched to a panel which was collected prior to the onset of the episode. Covariate information was extracted from the panel data by matching the time at the start of each episode with the closest prior interview time. Some questions were only asked in the first interview so where this is the case the information for all episodes comes from the round 1 panel. Where individuals joined the panel at round 2 the round 2 hybrid file is used. Those women joining for the first time at round 2 answered both round 1 and round 2 questionnaires at that time i.e. answers were given retrospectively for

round 1. Where individuals do not appear in the round 1 or round 2 panels the corresponding hybrid round 1 and round 2 files are used. Where an individual is missing in rounds 3 -7 for the required round to match the episode then the panel data for the prior round to the missing one is used. Characteristics captured by the panel data will have been collected at a time point between 1 and a maximum of 16 months prior to the first month of the episode in question. Socio-economic variables, such as age and education, were included along with factors directly affecting an individual's motivation to avoid pregnancy and variables measuring past experience of contraceptive use.

Some episodes were excluded from the data set on the basis of missing values for the covariate information. In total 20 episodes had missing data on key demographic or socio-economic characteristics. These cases amount to only 2.6% of all episodes and it was decided that the most appropriate action was to remove these cases from the dataset.

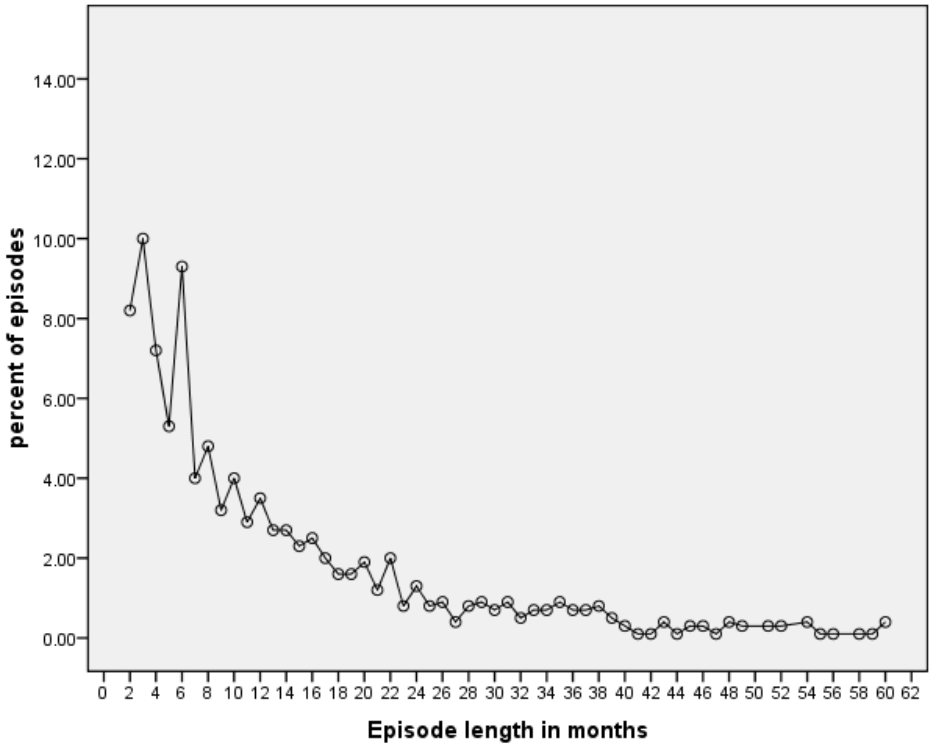
It is worth noting here that the original intention was to include some of the husband's demographic and socio-economic data as covariates in the regression. However this was not possible due to the high proportion of missing data for husband's characteristics, in some instances reaching 50% of data missing. It would have been possible to obtain husbands characteristics from the separate husband's dataset and match the cases back to the partner. However in this scenario the level of missing data in the husbands file would still have presented a problem. It was decided that, given previous studies have found husbands characteristics not to be a consistent predictor of discontinuation behaviour, they would not be included in this study (Ali & Cleland, 1995).

4.3.3: Data Quality

One persistent problem with the collection of retrospective demographic data is the rounding of the timing of events by the respondents resulting in the heaping of events on convenient intervals of time. One of the major benefits of calendar style data collection is that when compared to other methods of retrospective data it has been shown to significantly reduce heaping (Becker & Diop-Sidibe, 2003). This is because respondents are able to place reproductive or contraceptive events in time, relative to other events. Problems with heaping are often associated with the length of the recall period so given its short recall period the CCFCS should be superior to the DHS calendars in this regard. Figure 4.4 shows a plot of the percentage of all episodes lasting a given duration.

Figure 4.4 shows peaks at 3 and 6 months but this is to be expected in this data given the high proportion of episodes which are of injectable use (28% of all episodes are of injectable use and the most commonly available injectable, brand name Depo Provera, is a 3 monthly dosage formula). Therefore it is only possible for episodes of injectable use to discontinue at a duration which is a multiple of 3. Those experiencing problems with injectables early in an episode are therefore likely to discontinue at 3 or 6 months. Figure 4.4 does not show the peaks in the frequency of episodes of duration at 12 or 24 months which might be expected if heaping were a problem.

Figure 4.4: Percent of Episodes by Episode Length in Months (including episodes of duration >36 months)



4.3.4: Description of the Dataset

The final dataset contains 8937 women months of method use representing 732 episodes of use which are between 2 and 60 months duration. The data represents 476 individuals who each have between 1 and 6 episodes included in the dataset. Table 4.2 below shows the number of individuals who are contributing multiple episodes to the data.

Table 4.2: Number of Episodes Contributed by each Woman

Number of Episodes	Frequency (of individuals)	Percent
1	476	65
2	181	24.7
3	51	7.0
4	17	2.3
5	5	0.7
6	2	0.3

Overall 62% (295) of individuals contribute a single episode to the dataset while the remainder 181 (38%) contribute multiple episodes. Although the longest episode in the data set is 60 months duration the number of events (discontinuations or switches) occurring after 36 months is very small, leading any results for episodes of durations longer than 36 months to be unstable. In this case a total of 13 events occur after 36 months which represents 2.73% of all episodes or 2.76% of all events. Therefore any episodes in the data longer than 36 months are considered censored and are treated, along with all other censored cases, as episodes which did not end in a discontinuation or switch within the observation period. This is in line with similar studies which have also censored events after 36 months (Bradley et al 2009). Taking this into account table 4.3 shows the number of episodes which end in either a discontinuation or a switch to another method or are right censored. Close to 63% of episodes in the data have an observed event while the remaining episodes are censored.

Table 4.3: Outcome of Episodes

Outcome	Frequency (of episodes)	Percent
Discontinuation	365	49.8
Switch	93	12.7
Censored	274	37.5

4.3.5: Study variables

The following is a description of the variables used in this study and how they have been defined. A list of the variables and their coding is presented in Appendix 4C.

Outcome Variable

The outcome variable in this study is a binary variable which marks whether or not the episode of use has ended in an event or if it has been right censored. A discontinuation (an event) is coded 1 while no event (or a

censored observation) is coded 0. In the episode based file this takes the form of either an event or non-event being ascribed to each completed episode, while in the person-period file each month is coded according to whether an event has taken place that particular month. A discontinuation in this case can be either a stopping of use altogether or switch to another method. As previously described events taking place after 36 months duration are considered to be censored and coded as 0.

Experience of side effects

The main explanatory variable of interest in this study is the experience of side effects. This is collected in the contraceptive calendar and takes the form of monthly data which can be coded 0-14 to represent either no side effects or the different types of side effect as shown in table 4.4 below.

Table 4.4: Coding of Monthly Side Effects Variable

Side effect	Code
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

Each month can have up to four different side effects coded simultaneously and the full original data was combined and used for the purpose of describing the experience of side effects. In the person-period file descriptive analysis is done on the original calendar data which is month varying and coded 0-14. For the regression analysis this variable remains month varying

but is coded as a binary variable where 1 represents any type of side effects in that month and 0 means no side effect in that month. In the episode based file used in the life table analysis two binary variables were created from the original calendar data:

1) Side effect experienced in any month of the episode - Yes/no
2) Side effect experienced in last month of episode - Yes/no

The first variable gives a general measure of the extent of the experience of side effects. As this study does not have direct information on reason for discontinuation the second of these variables may be considered as a proxy for discontinuation due to side effects. Other variables were also created from the calendar data to act as proxies for other prominent possible reasons for discontinuation. Whether or not the husband was away in the last month of episode or first month after a discontinuation and whether or not the respondent was abstaining in the last month of episode or first month after a discontinuation may represent discontinuation due to a lack of exposure to the risk of pregnancy. If the respondent was pregnant within 9 months[9] after a discontinuation may represent a discontinuation with the intent of getting pregnant or a method failure.

Background explanatory variables

A range of other explanatory variables ere included in the logistic regression modelling representing three main areas, firstly socio-economic and demographic characteristics of the women; secondly variables representing

[9] It was not possible to find any studies estimating the time to pregnancy for a planned pregnancy following a contraceptive discontinuation in an Africa setting. A study based on data from 5 European countries found that on average just over 70% of women were pregnant within 6 months of being at risk (Juul et al, 1999). It was felt that setting the time limit in this case to 9 months was a suitable time period for pregnancy to occur for it to be linked back to the intent of the contraceptive discontinuation. This may underestimate the pregnancies of those women discontinuing episodes of injectable use who can take some months to regain their fertility after discontinuing.

contraceptive use past and present and communication regarding family planning related to the episode; and finally variables which reflect the motivation of the women to avoid a pregnancy. None of these variables is allowed to vary over time at the episode level; therefore the values of these variables may be different for the same women at different episodes but are constant within episodes. Each of the variables and how they were derived is outlined below.

Socio-economic and demographic variables:

- Age – respondent age in completed years at the first month of the episode. Derived by finding the age in completed years at round 1 interview and adding the number of real time months passed between the round one interview and the first month of the episode in question.
- Community – A categorical variable with a dummy representing each of the 6 study communities.
- Ethnicity – ethnicity of respondent measured at the round 1 interview. Recoded into three categories, Fante, Ga - Adangbe and Denkyira/ Ahanta/ Ewe/Other.
- Education – a derived variable created from combining the answers to 2 questions from round 1 interview – Have you ever attended school? and What is the highest grade of schooling you have ever completed? Respondents answering no to the initial question were coded as 'none' in the final variable and the original 29 categories of the second variable were collapsed to create a further three categories or Primary, middle/junior and secondary/higher.
- Religion – Religion of respondent at round 1 interview, recoded from the original 9 categories to 5 categories to avoid small numbers in any single category. The categories included are Catholic, Protestant, Moslem, Pentecostal, Other/none/traditional/syncretic.

- Children ever born – A derived variable created from a combination of panel and calendar data. The number of live births captured in the calendar from the first month of observation until the first month of the episode of contraceptive use in question was added to the number of children ever born reported by the respondent at the round 1 interview. This continuous variable with minimum value of zero and maximum value of 11 was then recoded into a categorical variable with categories, None, 1 or 2, 3 or 4, 5 or more[10].

Contraceptive Use and Communication:

- Method of use for the episode – for descriptive purposes the method used is coded into 13 categories (see appendix 4C) but for the purposes of life table estimations and modelling a four category variable was used with categories being pill, injection, condom and other. This variable was also used to select cases in order to fit separate models for pill and injection users.
- Respondent has discussed Family Planning with husband – Yes/no. This variable is the answer to the question 'since the last interview have you discussed family planning with your husband?' This is an episode based variable created by obtaining data from the closest panel interview prior to the first month of the episode. For data taken from the round 1 panel the question answered was 'have you ever discussed family planning with your husband?'
- Encouragement given by a health worker in any one or more months of the episode - Yes/No. This variable is derived from the calendar data in which each month of an episode is coded according to advice received from a health worker that month. The variable is coded 1 if encouragement to continue was received in any month of the episode

[10] This variable may be an underestimate of the actual number of children ever born due to the fact that multiple births are not identified in the calendar and will have been treated in the creation of this variable as if they were single births.

and 0 if either no advice was received or advice other than encouragement was received.

- Respondent has ever talked to anyone who encouraged/discouraged family planning - Yes/no. This is two variables representing whether or not the respondent has ever been either encouraged or discouraged by anyone (other than a health worker) to use family planning. The variable is derived from the panel data in the same way as discussing family planning with husband.
- Respondent has ever used pill/injection (in the time before the observation period) current pill/injection episodes only - Yes/no. These two variables are derived from a combination of panel and calendar data. For current episodes of pill use it is determined if the respondent used the pill prior to round 1 from the round 1 interview and this is combined with data from the calendar showing if the respondent used the pill in another episode of use which for reasons of censoring was not included in the dataset. The final variable determines whether or not there has been any prior use of the pill before the current pill episode. The same procedure is followed for episodes of injection use. This specifics not only prior experience of contraception but prior experience of the same method as the method used in the episode in question.

Motivation to Avoid Pregnancy:

- Respondents' reproductive intentions – reproductive intentions are measured from the closed panel data prior to the start of the episode and are based on intentions to have children with the current husband or partner at that time. Respondents are categorized as, want (more) children, want no (more) children, can't get pregnant, undecided and don't know. Due to small numbers in the last of these three categories they were combined.

- Ideal number of children – Questions about ideal number of children were only asked at round 1 so this variable was taken from the round 1 panel only. Originally a continuous variable it was recoded as a categorical variable with categories, none 1 or 2, 3 or 4, 5 or more and non-numerical response.[11]
- Ease of becoming pregnant – As a measure of respondents own perception of their fecundity they were asked at round 1 how easily they became pregnant if they wanted to. Categories are quickly, takes a long time, can no longer get pregnant and don't know. As with previous variables the last two of these categories were combined due to small numbers.

4.3.6: Methods

Two different discrete time event history techniques are used to analyze the data for this study. The first is single decrement life tables which are used to provide descriptive statistics such as median episode length and to estimate the percentage of users discontinuing an episode within a given time, in this case 12 and 24 months. Logistic regression is used to determine the effect of side effects on the propensity to discontinue a method while controlling for covariate factors. A multi-level model is used to control for the fact that each individual can contribute more than one episode to the dataset.

As previously mentioned left censored observations cannot be included in the analysis but also excluding right censored observations would introduce bias and drastically reduce the sample size. In event history analysis, right censored observations are included on the basis that they are non-informative (i.e. independent of censoring mechanism) (Steele, 2005). In this instance, this assumption should hold for the majority of cases, but it is worth noting that due to the longitudinal nature of the data collection

[11] Non-numerical responses include up to God, all eggs in body, don't know, or other.

individuals can be right censored by other causes than the end of the observation period. There could be attrition bias if individuals missing in follow up rounds were lost for reasons related to their contraceptive use.

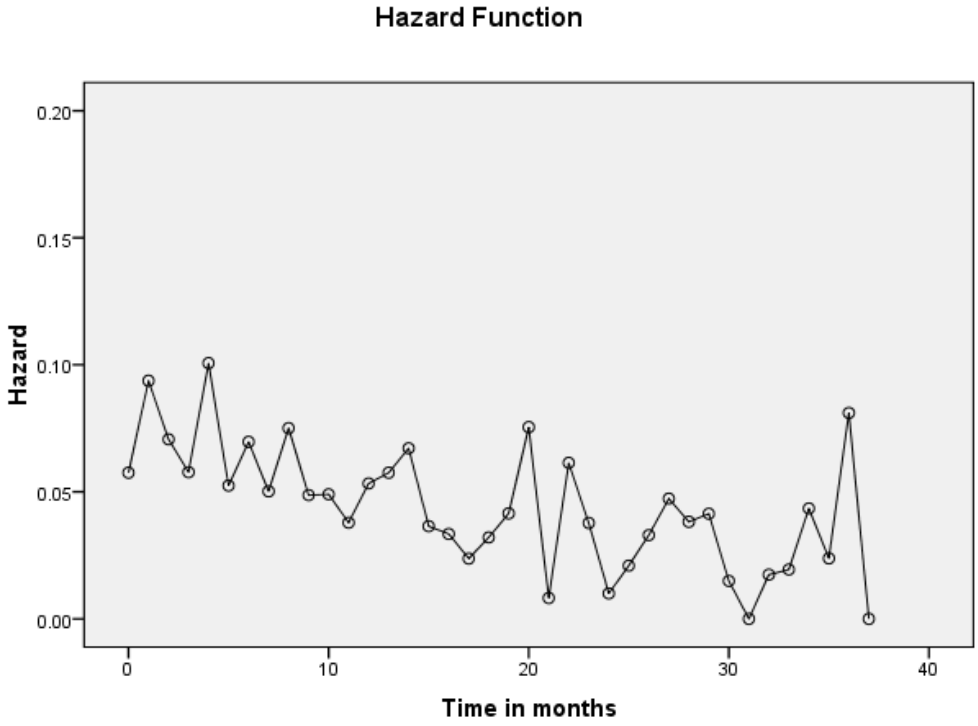
Single decrement life tables are used to analyze the duration of episodes by modelling the hazard rates of discontinuation. The hazard function h (t) is the probability of an event occurring during interval t, given that the event did not occur before time t, which can be defined as: $H(t) = Pr(T = t \mid T \geq t)$ where T is the event time. Also of interest is the survivor function S (t) which can be obtained from the hazard rate and is the probability that an event has not occurred before time t. $S(t) = Pr(T \geq t)$ (Yamaguchi, 1991). The data used for the life tables is the episode based file where t_j = time to event for episode j and δ_j = a dummy variable indicating if the observation is censored, coded 1 if censored 0 otherwise. The life table analysis is broken down by method, concentrating on pill and injectable use, and by the experience of side effects as outlined previously.

For the multivariate modelling, although the underlying process of discontinuation can theoretically occur at any time on a continuous scale, it is natural to use a discrete time approach, given that the data was collected in discrete time intervals. The discrete time approach also solves the problem that in continuous time models it is assumed that only one event can occur at a time and there can be problems with ties in the data where multiple events occur in the same time period (Jenkins, 2004). The data used is the person-period format, where each case represents one month of use within an episode. The model used is a logistic discrete-time hazards model where the log odds of an event versus no event in any given month are modelled as a function of duration of episode and covariates. The parameter estimates are the log odds ratios of a discontinuation for any given set of covariate characteristics and the exponential of the coefficients is the odds ratio, which is equal to one where X and Y are independent. The logit model is specified as:

$$\text{logit}(h_{it}) = \log\left(\frac{h_{it}}{1-h_{it}}\right) = \alpha(t) + \beta' x_{it} \qquad (4.1)$$

Where the covariates X_{it} can be fixed or time varying and α(t) is the baseline logit-hazard which is a function of t. The shape of the baseline hazard can be checked by plotting the hazard estimated from the life table analysis against time without controlling for any other variables. Figure 4.5 shows the baseline hazard to 36 months treating both switching and stopping as discontinuation. Given the shape of the baseline hazard, a step function is used to specify α(t) in this analysis. This is the most flexible form of α(t) and is achieved by treating t as a categorical variable and defining each category with a dummy variable. In this case dummies were created representing 0-6, 7-12, 13-24 and more than 24 months episode duration. This results in a piecewise-constant hazards model where the hazard is assumed constant within each of the categories of time and the baseline logit hazard takes the form: $\alpha(t) = \alpha + \alpha_2 D_2 + \alpha_3 D_3 + \alpha_4 D_4$ where α is the overall intercept and D_{2-4} are the duration dummies minus a baseline category.

Figure 4.5: Baseline Hazard of Discontinuation to 36 Months



A model was fitted with only duration effects included to assess the fit of the piecewise-constant function of time to the data and it was found to be a suitable specification. Non-proportional effects of method, the experience of side effects and receiving advice from a health worker on discontinuation rates were tested by including interactions between these explanatory variables and duration.

A main-effects model was selected using forward selection based on the principle of a nested hierarchy of models where the reduced model (L_0) is a smaller and simpler model, which is compared to a full model (L_1) that is more complex. The statistical significance of adding a parameter to the model was tested using the likelihood ratio test to determine the deviance in the L^2 statistic between the full and reduced models by testing that the extra parameters in the full model equal 0. The formula for the likelihood ratio statistic is:

$$-2\log\left(\frac{L_0}{L_1}\right) = (-2\log L_0) - (-2\log L_1) \qquad (4.2)$$

H_o is that there is no difference between models and L_o represents the model where H_o is true with df equal to the number of additional parameters in L_1.

Once the fixed effects are selected the model is further extended into a multi-level model or frailty model. Each episode of use in this data set is a repeatable event and it is possible for each individual to contribute more than one event, as explained in chapter 4.3.3. Therefore there may be unobservable individual specific factors which lead to correlation between the durations of episodes from the same individual. For example one would expect women who have difficultly with the use of a method to have shorter episodes and contribute multiple short episodes to the data whereas women with no difficulties may have longer continuous episodes of use and may contribute only one episode (Steele et al., 1996). Similarly individuals who are more sensitive to side effects (less tolerant) are more likely to report side effects and also more likely to discontinue, but this sensitivity is not usually observable. Failure to account for this unobserved heterogeneity will lead to biased estimates and underestimated standard errors resulting in overestimation of the significance of variables (Snijders & Bosker, 1999). A two level model is used to allow for the hierarchical structure arising from having repeated episodes nested within individuals. Level one is represented by each case in the person-period data and level two refers to each individual woman. The multi-level model is a simple extension of model 4.1 including an extra term to represent variation at the woman level.

$$\text{logit}[h_{ijt}] = \alpha(t) + \beta x_{ijt} + u_j \qquad (4.3)$$

Where u_j is a random effect for individual j which follows a normal distribution with mean o and variance σ_u^2. The random effect is interpreted as residual variance between individuals due to unobserved time-invariant characteristics. The random effects model is fitted following the same principles of selection as the fixed effects model by creating nested models. However, for a multi-level logistic model estimated using the quasi-likelihood approximation the likelihood ratio test is unreliable (Snijders & Bosker, 1999). The Wald test is used instead to test whether the random intercept parameters introduced to the model are significant.

Results are interpreted by calculating predicted probabilities of discontinuation in each time period for a given set of episode characteristics using the formula in 4.4.

$$\hat{p} = \frac{\exp(a + b_1x_1 + b_2x_2 .... + b_kx_k)}{1 + \exp(a + b_1x_1 + b_2x_2 .... + b_kx_k)} \qquad (4.4)$$

The descriptive and main effects modelling were conducted in SPSS v. 16.0 and the random effects were added using MLwiN V. 2.02.

4.3.7: Limitations

The main limitation of this study is the limited representativeness of the CCFCS. A random probability sample (or complete census) was conducted within each of the six study communities so the data can be said to be representative of those six communities but extreme caution must be draw in making inferences to any wider population beyond this. The socio-economic context of Northern Ghana is sufficiently different to that represented by this data that the results cannot be said to be relevant to Ghana as a whole. The compensation for the limited generalizability of the data is its longitudinal

design which allowed for the calendar data to be collected with minimal recall periods. Although this is a significant improvement on other surveys collecting data of this type it should be noted that there is still some detailed recall involved in this data collection and as such there is the potential for some recall bias. This is especially the case given the complexity of the calendar data collected which placed a high respondent burden for recalling multiple simultaneous events. Another possible source of bias associated with longitudinal surveys is attrition bias. However, given the generally high retention rate in the women's survey it is not felt that this is a significant problem in this study. A final limitation related to the data is that the sample size is insufficient to allow for analysis to be conducted specialty on sub-groups, for example according to method.

A further limitation of this study relates to the chosen methodology in which left censored episodes are not able to be included in any analysis. This causes the loss of a significant amount of data and potentially leads to over estimates of discontinuation rates because long time users who use consistently throughout the entire observation period are excluded due to left censoring. Finally a major limitation of the data in relation to this study is the lack of information on reason for discontinuation. The highly detailed and comprehensive calendar makes up for this in part, by allowing the inference of the reason for discontinuation based on the behaviour observed at the time the episode ended. However this is making very large assumptions about the unknown motivations and perceptions of the individuals involved at the time.

4.4: Results

4.4.1: Descriptive statistics

4.4.1.1: Respondent Characteristics

Table 4.5 shows the percentage distribution within the factors of the study variables according to both episode and individual. As shown previously in chapter 4.3.3 51.4% of episodes end in a discontinuation and 13% in a switch to another method. For the purposes of this analysis switches are treated as discontinuations as they are the stopping of that particular method episode. Around 20% of respondents are from communities 2, 4 and 6 with slightly less from the remaining three communities and the proportion of respondents per community is roughly analogous to the proportion of episodes of use contributed by each community. The majority of respondents are aged between 25 and 34, are of Fante ethnicity and have completed middle or junior secondary school. There is a relatively even distribution of respondents among religious groups with slightly more Pentecostals and less Protestants. Very few individuals (8.2%) have no children at the start of their first episode, while over 30% have 5 or more.

Injectables are the most commonly used method and account for 28% of all episodes, followed by the pill accounting for 23%. The next most commonly used modern method is condoms which contribute 13% of episodes. Given that traditional methods are not commonly associated with side effects, and the small number of episodes associated with the remaining modern methods, these will be grouped together to form an 'other' category for the rest of the analysis.

Table 4.5: Background Characteristics of Sample: Episodes and Individuals

Variable	Category	Individuals*	Episodes
		Frequency (%) n = 476	Frequency (%) n = 732
Event	Discontinuation	-	365 (51.4)
	Switch	-	93 (13.0)
	Censoring	-	274 (35.6)
Socio-economic/demographic			
Community	1	73 (15.3)	116 (15.8)
	2	99 (20.8)	168 (23)
	3	66 (13.9)	100 (13.7)
	4	98 (20.6)	130 (17.8)
	5	48 (10.1)	62 (8.5)
	6	92 (19.3)	21.3 (21.3)
Age	16-24	146 (30.7)	216 (29.5)
	25-34	211 (44.3)	343 (46.9)
	35+	119 (25)	173 (23.6)
Ethnicity	Fante	198 (41.6)	296 (40.4)
	Ga - Adangbe	127 (26.7)	218 (29.8)
	Other/Denkyira/ Ahanta/ Ewe	151 (31.47)	218 (29.8)
Education	None	131 (27.5)	191 (26.1)
	Primary	128 (26.9)	212 (29)
	Middle/Junior	194 (40.8)	294 (40.2)
	Secondary/Higher	23 (4.8)	35 (4.8)
Religion	Catholic	88 (18.5)	129 (17.6)
	Protestant	84 (17.6)	121 (16.5)
	Moslem	112 (23.5)	185 (25.3)
	Pentecostal	132 (27.7)	214 (29.2)
	Other/none/traditional/Syncretic	60 (12.6)	83 (11.3)
Children ever born	None	39 (8.2)	53 (7.2)
	1-2	147 (30.9)	235 (32.1)
	3-4	135 (28.4)	212 (29)
	5+	155 (32.5)	232 (31.7)
Contraceptive Use and Communication			
Method	Pill	106 (22.3)	167 (22.8)
	Injectable	121 (25.4)	205 (28)
	Foam/diaphragm/jelly	13 (2.7)	19 (2.6)
	Condom	70 (14.7)	95 (13)
	IUD	11 (2.3)	14 (1.9)
	Rhythm	99 (20.8)	141 (19.3)
	Withdrawal	19 (4.0)	35 (4.8)
	Herbs	32 (6.7)	48 (6.6)
	Norplant	4 (0.8)	7 (1)
	Other	1 (0.2)	1 (0.1)
Respondent has discussed Family Planning with husband	No	108 (22.7)	141 (19.3)
	Yes	349 (73.3)	567 (77.5)
	Don't know	19 (4)	24 (3.3)

Table 4.5 continued: Background Characteristics of Sample: Episodes and Individuals

Variable	Category	Individuals*	Episodes
		Frequency (%) n = 476	**Frequency (%) n = 732**
Encouragement given by a health worker in any one or more months of the episode	No	-	433 (59.2)
	Yes	-	299 (40.8)
Respondent has ever talked to anyone who encouraged family planning	No	147 (30.9)	209 (28.6)
	Yes	329 (69.1)	523 (71.4)
Respondent has ever talked to anyone who discouraged family planning	No	329 (69.1)	502 (68.6)
	Yes	147 (30.9)	230 (31.4)
Respondent has ever used pill (in the time before the observation period) current pill episodes only **n = 167**	No	-	86 (51.5)
	Yes	-	81 (48.5)
Respondent has ever used injection (in the time before the observation period) current injection episodes only **n = 205**	No	-	125 (61)
	Yes	-	80 (39)
Motivation to Avoid Pregnancy			
Respondents reproductive intentions	Wants a (another) child	266 (55.9)	408 (55.7)
	Wants no more (none)	177 (37.2)	272 (37.2)
	Cannot get pregnant/ Undecided/Don't Know	33 (6.9)	52 (7.1)
Ideal number of children	None, 1 or 2	48 (10.1)	86 (11.7)
	3 or 4	278 (58.4)	437 (59.7)
	5+	110 (23.1)	148 (20.2)
	Non-numerical response/don't know	40 (8.4)	61 (8.3)
Ease of becoming pregnant	Quickly	229 (48.1)	348 (47.5)
	Takes a long time	161 (33.8)	255 (34.8)
	Can no longer become pregnant/ Don't Know	86 (18.1)	129 (17.6)

*Individual data calculated using the first episode of use within the dataset for each individual

It would be expected that most individuals would have discussed family planning with their husbands given that all are current users of a method. The 23% of women who report they have not discussed with their husband may be engaged in the secret use of a method without their husband's knowledge. Encouragement by a health worker at some point during the episode is reported in over 40% of episodes, 70% of all individuals report ever being encouraged by someone to use family planning while only 31% report being discouraged. In around half of the episodes of pill use the user reports having used the pill before but this is only true for 40% of injectable episodes. In terms of motivation to avoid pregnancy table 4.5 shows that the majority of respondents want another child and feel that they can get pregnant quickly if they want to. The ideal number of children is 3 or 4 for almost 60% of respondents.

4.4.1.2: The Experience of Side Effects

As previously described the monthly calendar data allowed each respondent to mention up to three different side effects simultaneously per month. In total 605 months of side effects were experienced during the total 8937 months of use. Of these 605 months there were 59 months where two different side effects were reported in the same month (thus contributing 118 months of side effects to the total) and 1 month where 3 different side effects were reported (thus contributing 3 months to the overall total). Table 4.6 shows the number of months in which side effects were reported by type of side effect. Table 4.6 shows that the most frequently experienced side effect is irregular cycle which accounts for almost 23% of all months of side effects experienced. This is followed by headache, cramp, irregular heartbeat, dizziness and other which all contribute more than 10%.

Table 4.6: Number of Months Side Effects Experienced by Type of Side Effect

Type of side effect	**Number of months reported**	**% of reported side effects**
Dizziness	61	10.1
Weight gain	13	2.1
Weight loss	8	1.3
Headaches	89	14.7
Excessive bleeding	21	3.5
Irregular cycle	138	22.9
Painful period	4	0.7
Stomach pains/cramps	61	10.2
Irregular heart beat	84	13.8
Marital problems	5	0.8
Loss of pleasure	24	4.0
Loss of strength or ill health	20	3.3
Other	77	12.6
Total	605	100

Table 4.7 shows the number of months of use of pill, injectable and condom use, with all other methods grouped into the 'other' category as previously. This table also shows the number of months in which a side effect was experienced for each of the methods. Measured as a percentage of episodes injectable use accounts for around 25% of all use however measured as months of use this rises to 37% due to the longer episodes of use of injectables. The percentage of months of 'other' method use is also high at 36% and this reflects the long episodes of IUD and implant users who are in this category. Of all the months of side effects experienced 55% are caused by injectables and 33% caused by pill use. However as a percentage of the total number of months of use for that method pill and injectable are roughly the same with 11.5% and 10.1% of months with side effects reported respectively. As expected condoms and other methods have a considerably lower proportion of months of side effects reported.

Table 4.7: Months of Use of Method and months of Side Effects Experienced by Method

	Pill		**Injection**		**Condom**		**Else**	
	Number of months	%	Number of months	%	Number of months	%	Number of months	%
Total months of use	1716	19.0	3324	37.0	729	8.0	3229	36.0
Months with no side effects	1518	18.1	2989	35.6	705	8.4	3181	3.9
Months with side effects*	198	32.6	335	55.4	24	4.0	48	8.0
% of months of side effects within method	-	11.5	-	10.1	-	3.3	-	1.5

* Total is more than total months of use minus months with no side effects due to the effect of months where two or three side effects are reported simultaneously.

Table 4.8 shows the number of months reported for each method by specific type of side effect. Around one third of the reported months of side effects associated with injectable use were of irregular cycle. This is to be expected given the established clinical effects of this method; however there is still some uncertainty over the reporting of this type of side effect. It is possible that where individuals are expecting this effect and/or do not perceive menstrual disruption to be disturbed they will not report this as a side effect when questioned. Therefore the level of menstrual disruption may be underestimated in surveys not specifically measuring menstrual changes.

Table 4.8: Months of Side Effects Experienced by Method and Type of Side Effect

Type of side effect	Number of months reported			
	Pill	Injection	Condom	Else
Dizziness	11	41	0	9
Weight gain	2	8	0	3
Weight loss	3	0	5	0
Headaches	45	43	0	1
Excessive bleeding	6	15	0	0
Irregular cycle	30	105	0	3
Painful period	1	3	0	0
Stomach pains/cramps	34	26	0	1
Irregular heart beat	24	51	0	9
Marital problems	0	0	0	5
Loss of pleasure	0	0	17	7
Loss of strength or ill health	9	5	0	6
Other	33	38	2	4
Total	198	335	24	48

Table 4.8 shows that irregular heart beat, headaches and dizziness each contribute between 12- 15% of months of side effects for injectable users. For months of use of the pill the most commonly reported side effect is headaches which accounts for 23% of all months. This is followed by stomach cramps, irregular heart beat, irregular cycle and other which each contribute between 17% and 12% of months of reported side effects. As expected, side

effects are relatively infrequently reported for condom use and use of 'other' methods. Some 17 months of the side effect of loss of pleasure are reported for condom use which is as expected and the 'other' category also contains some reported loss of pleasure which can most likely be attributed to the use of withdrawal. The finding that weight loss is reported as a side effect of condom use is anomalous and cannot be explained. It is possible that this simply reflects an error in data entry or coding, it is also possible that this has arisen due to the process of combining multiple simulations methods and selecting the most effective, outlined in section 4.3.2. This would mean that the side effect was actually caused by a less effective method that was being used simultaneously with the condom. In this case the second method was either IUD, foam/jelly/Diaphragm or a traditional method, so it is still improbable that these would cause the side effect of weight loss.

4.4.1.3: Reasons for Discontinuation

As previously mentioned almost 63% of episodes end in a discontinuation (counting switches as discontinuations as previously mentioned) the remainder being right censored. The reason for discontinuation is not collected by the survey however it is possible to use the calendar data to extract some information which can be used to infer the reason for discontinuation. Table 4.9 shows these assumed reasons for discontinuation. Although the classifications in table 4.9 are relying on some large assumptions it is potentially informative to model the data without the episodes which can be said to be discontinued due to reasons other than side effects. Altogether, 318 episodes end either with desire to get pregnant (or pregnancy) or low risk of exposure to pregnancy, which implies that 29 episodes end in both reasons which is of course somewhat of a contradiction. The bivariate and multivariate model results show the effect of the removal of these cases on the relationship between the experience of side effects and discontinuation.

Table 4.9: Assumed Reasons for Discontinuation of Episode*

Assumed reason for discontinuation	Measure	Number	Percent of all episodes
Side effects	Side effects in last month of episode	86	11.7
Wants to get pregnant	Birth within 9 months of discontinuation‡	159	21.7
Not at risk of pregnancy	Abstaining in month before discontinuation and/or Husband away in month before discontinuation	188	25.7

* It is possible for each episode to fall into more than one of these categories
‡ Includes pregnancy in the first month after use which would be considered a contraceptive failure

4.4.2: Life Table Analysis

4.4.2.1: Duration of Episodes and Discontinuation Rates by Method

Table 4.10 presents results from life tables calculated separately for each method, methods grouped into modern and traditional, and method grouped into four categories. In each case the table shows the proportion of episodes which are continuing at 12 and 24 months and the median survival time in months. The results show that as would be expected IUD and Norplant have the longest average episode length, although these figures may be unreliable due to the small number of cases. Focusing on the pill and injection, which are the hormonal methods most commonly associated with side effects, the survival time for injection users is more than double that for pill users. Three quarters of pill users have discontinued by 24 months compared to just over half of injection users. Episodes of condom use are generally shorter than any other method with a median duration of 7.67 months and less than 10% of episodes continue beyond 24 months.

Table 4.10: Median Episode Duration and Proportion of Episodes Continuing at 12 and 24 Months by Method

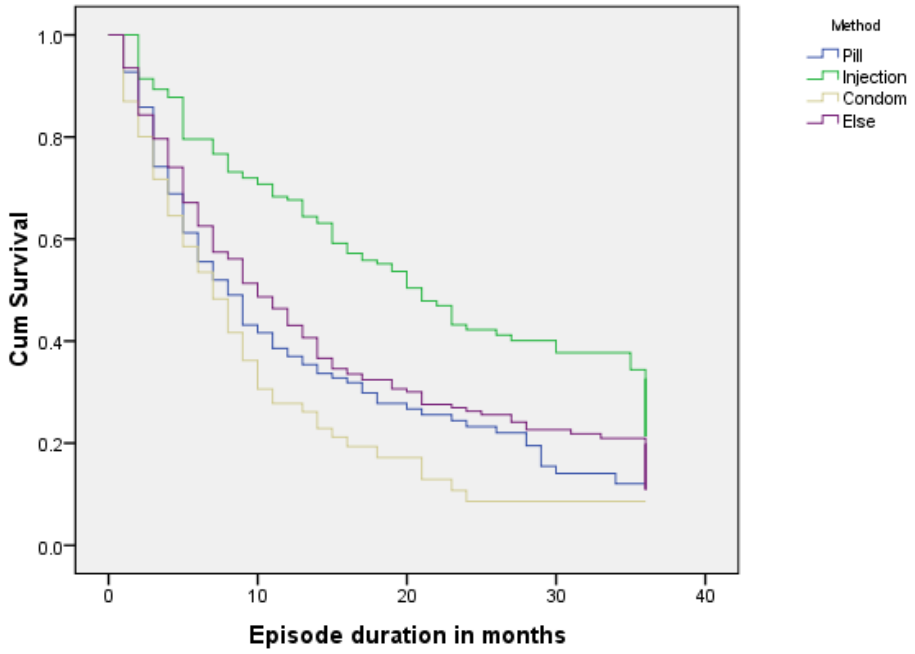
Variable	Category	Median episode duration	Proportion of episodes continuing at 12	Proportion of episodes continuing at 24
Method	Pill	8.67	0.37	0.23
	Injection	21.16	0.68	0.42
	Foam/jelly/diaphragm*	4.77	0.28	0.07
	Condom	7.67	0.28	0.09
	IUD*	36.00	0.77	0.66
	Norplant*	33.94	1.00	0.80
	Traditional methods	9.86	0.41	0.24
	Else[12]	10.50	0.43	0.26
	All modern methods	12.54	0.50	0.30

* Figures should be interpreted with caution due to the small number of users of these methods

[12] Else = combination of Foam/jelly/diaphragm, IUD, Norplant and Traditional methods catagories.

Figure 4.6 is a plot of the cumulative survival probability of an episode lasting to 36 months by method. The plot shows that the probability of continuation of pill, condom and other users drops quite sharply in the first 12 months and then begins to level off. Episodes of injectable use do not see such sharp declines and level off at a higher rate of continuation than the other methods.

Figure 4.6: Plot of Cumulative Survival Function by Method



4.4.2.2: Duration of Episodes and Discontinuation Rates According to Side Effects Experienced

Table 4.11 shows the proportion of episodes which are continuing at 12 and 24 months and the median survival time in months according to whether or not a side effect was experienced during the episode. Both variables representing side effect, in any month of the episode and in the last month of the episode are used. The results show that in both cases the experience of side effects increases the median duration of the episode. In addition, the

proportion surviving to 12 and 24 months is greater for those experiencing side effects in any month. This is not surprising given that the longer the duration of the episode the more chance there is of a side effects occurring and being reported, although generally side effects occur more frequently in the beginning of an episode.

Table 4.11: Median Episode Duration and Proportion of Episodes Continuing at 12 and 24 Months by Experience of Side Effects

Variable	Category	Median episode duration	Proportion of episodes continuing at 12	Proportion of episodes continuing at 24
Side effect experienced in any month	No	10.85	0.45	0.27
	Yes	14.08	0.54	0.31
Side effect experienced in last month of episode	No	11.44	0.47	0.32
	Yes	11.29	0.47	0.16

In order to further investigate this issue life tables were constructed separately by pill and injection use for episodes with and without side effects. The results are shown in table 4.12. These results show that the relationship between side effects and median episode duration is different for episodes of pill or injectable use. For pill use the median episode duration is slightly longer when side effects are experienced but for injectable it is the opposite with episodes being noticeably longer if side effects are not experienced. Where side effects are experienced in the final month of an episode only 20% of episodes survive beyond 24 months compared to 50% when side effects are not experienced. It appears from these results that the experience of side effects does shorten the duration of the episode on average but only for episodes of injectable use.

Table 4.12: Median Episode Duration and Proportion of Episodes Continuing at 12 and 24 Months by Experience of Side Effects in Episodes of Pill or Injection use

Variable	Category	Median episode duration	Proportion of episodes continuing at 12	Proportion of episodes continuing at 24
Pill				
Side effect experienced in any month	No	7.88	0.33	0.21
	Yes	10.63	0.46	0.32
Side effect experienced in last month of episode	No	8.37	0.37	0.26
	Yes	9.53	0.38	0.16
Injection				
Side effect experienced in any month	No	23.58	0.69	0.49
	Yes	17.64	0.66	0.33
Side effect experienced in last month of episode	No	26.12	0.68	0.50
	Yes	15.78	0.67	0.20

Figure 4.7 shows the cumulative survival function according to the experience of side effects in the last month of the episode plotted up to 36 months for pill episodes only. The plot shows that pill episodes have approximately the same probability of survival (or continuation), which is falling sharply over time, until around 12 months. At this time the probability of continuation continues to decrease at a faster rate when side effects are experienced in the last month than when they are not.

Figure 4.7: Plot of Cumulative Survival Function by Experience of Side Effect in Last Month for Episodes of Pill Use

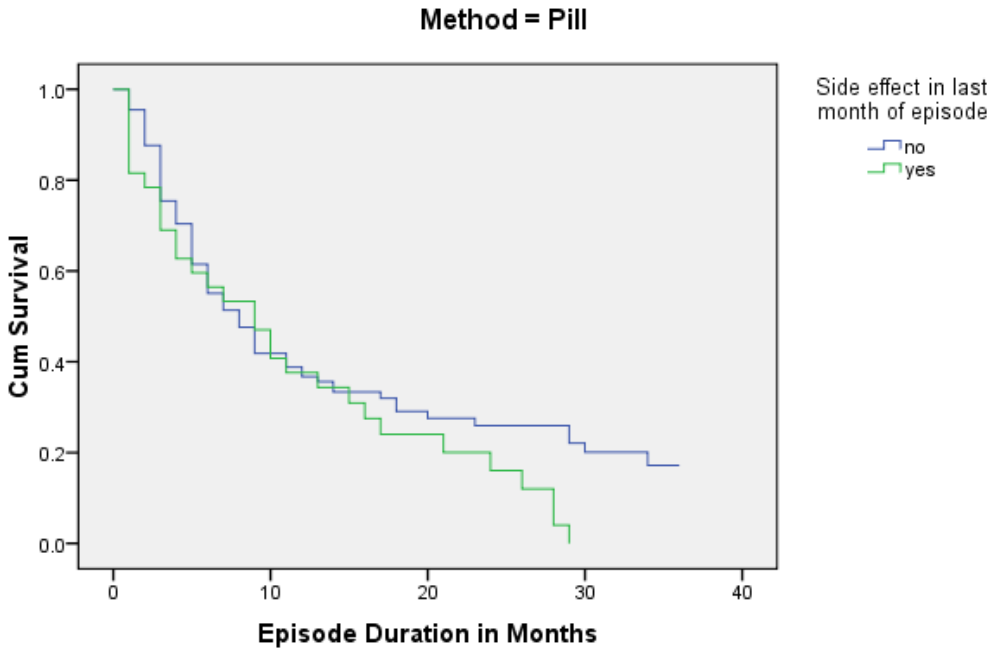
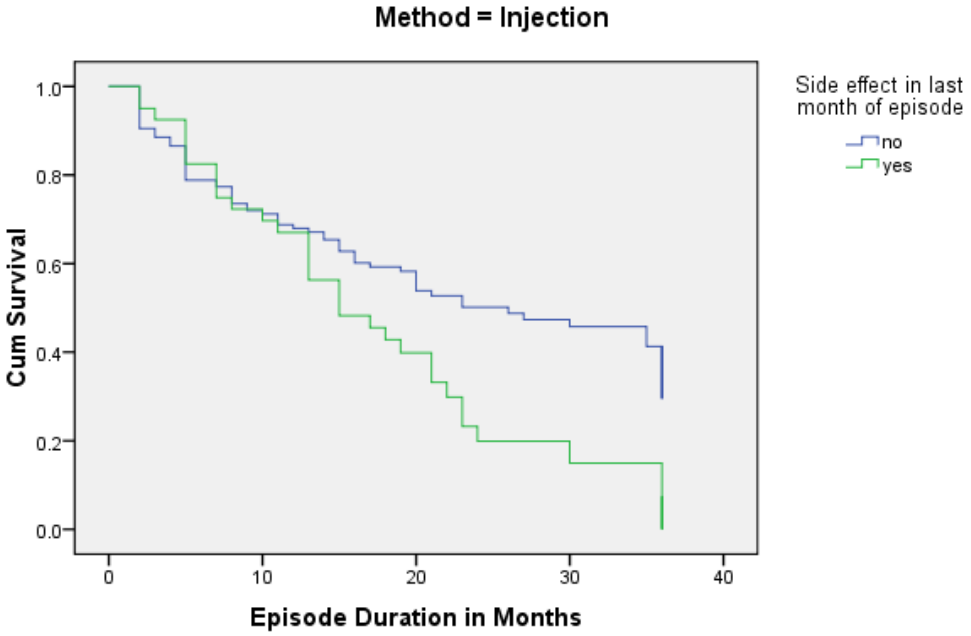


Figure 4.8 shows the equivalent plot for episodes of injectable use only and shows a similar overall trend to figure 4.7. However, for episodes of injectable use the probability of survival falls much less rapidly over time, especially for those episodes not experiencing side effects. The result is that the probability of continuation between the two groups is more divergent for injectable episodes than for pill episodes.

Figure 4.8: Plot of Cumulative Survival Function by Experience of Side Effect in last month for Episodes of Injection Use



4.4.2.3: Duration of Episodes and Discontinuation Rates by Background Variables

Table 4.13 shows life table results for all background variables to determine the effect if any, of the Socio-economic and motivational characteristics attached to each episode on the duration of the episode. Episodes last longest and have the highest probability of survival to 12 and 24 months in community 4, among those in the Other/Denkyira/ Ahanta/ Ewe ethnicity category and Catholics. The median duration of episodes rises with age and with number of children ever born. Median episode duration also rises with

education level, although those with no education do not fit this pattern with longer median episode duration and a higher probability of surviving to 12 months than those with middle/junior education. Episodes are on average longer when the respondent has received advice from a health worker, talked about family planning with their husband or been encouraged to use family planning by someone else. However being discouraged from using family planning, and reproductive intentions seem to have almost no effect. There is no clear pattern to be seen in the ideal number of children and the ease of getting pregnant categories.

Table 4.13: Median Episode Duration and Proportion of Episodes Continuing at 12 and 24 Months by Background Explanatory Variables

Variable	Category	Median episode duration	Proportion of episodes continuing at 12 months	Proportion of episodes continuing at 24 months
Community	1	8.50	0.36	0.25
	2	12.68	0.50	0.24
	3	9.40	0.41	0.23
	4	20.64	0.58	0.46
	5	12.26	0.47	0.30
	6	10.91	0.45	0.22
Age	16-24	7.85	0.37	0.18
	25-34	13.21	0.51	0.31
	35+	13.69	0.52	0.35
Ethnicity	Fante	9.54	0.41	0.26
	Ga - Adangbe	11.61	0.47	0.20
	Other/Denkyira/ Ahanta/ Ewe	15.52	0.54	0.37
Education	None	13.19	0.51	0.27
	Primary	8.56	0.36	0.25
	Middle/Junior	13.15	0.50	0.31
	Secondary/Higher	16.61	0.56	0.29
Religion	Catholic	15.94	0.53	0.36
	Protestant	13.02	0.50	0.25
	Moslem	11.84	0.47	0.26
	Pentecostal	10.49	0.44	0.27
	Other/none /traditional/Sync.	7.89	0.40	0.29
Children ever born	None	5.16	0.21	0.18
	1-2	9.77	0.44	0.20
	3-4	13.03	0.50	0.30
	5+	13.68	0.52	0.37

Table 4.13 continued: Median Episode Duration and Proportion of Episodes Continuing at 12 and 24 Months by Background Explanatory Variables

Variable	Category	Median episode duration	Proportion of episodes continuing at 12 months	Proportion of episodes continuing at 24 months
Respondent has discussed Family Planning with husband	No	10.55	0.41	0.26
	Yes	12.17	0.49	0.29
Encouragement given by a health worker in any one or more months of the episode	No	10.26	0.43	0.24
	Yes	13.90	0.52	0.34
Respondent has ever talked to anyone who encouraged family planning	No	9.52	0.44	0.23
	Yes	12.13	0.48	0.30
Respondent has ever talked to anyone who discouraged family planning	No	11.41	0.47	0.28
	Yes	11.36	0.47	0.27
Respondents reproductive intentions	Wants a (another) child	11.26	0.46	0.26
	Wants no more (none)	11.90	0.48	0.31
	Cannot get pregnant/ Undecided/Don't Know	8.53	0.47	0.31
Ideal number of children	None, 1 or 2	9.45	0.42	0.21
	3 or 4	10.80	0.46	0.26
	5+	13.44	0.51	0.35
	Non-numerical response/don't know	13.01	0.50	0.34
Ease of becoming pregnant	Quickly	12.82	0.50	0.29
	Takes a long time	10.84	0.46	0.31
	Can no longer become pregnant/ Don't Know	7.88	0.38	0.20

4.4.2.4: Duration of Episodes and Discontinuation Rates with Reason for Discontinuation Assumed

As discussed in section 4.4.1.3 a number of possible reasons for discontinuation can be assumed from the calendar data. The previous life table analysis has been rerun to see the effect of removal from the dataset of episodes of use which can be assumed to have ended due to wanting a pregnancy (or becoming pregnant) and being at low risk of pregnancy due to lack of exposure. Table 4.14 presents the results and shows that with respect to method type the pattern stays the same while the median method length increases in all cases. This makes substantive sense given that those who discontinued within 36 months to get pregnant could reasonably be considered spacers which would mean that after these episodes are removed, the balance of the remaining episodes will be towards limiters who would naturally have longer episode durations. The proportions of episodes surviving to 12 and 24 months also increase with 57% of injectable episodes and 34% of pill episodes continuing beyond 24 months. Median episode length also goes up overall for the life tables results split by the experience of side effects and the unexpected result seen previously is no longer in evidence. For episodes where side effects are experienced in any month of the episode the median duration is 20 months and for side effects experienced in the last month of the episode it is 14 months. In both cases this is considerably shorter that the approximately 24 month median duration when no side effects are experienced. When this is further broken down by method it can be seen that this pattern persists with pill episodes being in general shorter than injectable episodes and episodes with side effects in general shorter than those without.

Table 4.14: Median Episode Duration and Proportion of Episodes Continuing at 12 and 24 Months by Method and Experience of Side Effects with Reason for Discontinuation Assumed

Variable	Category	Median episode duration	Proportion of episodes continuing at 12 months	Proportion of episodes continuing at 24 months
Method	Pill	13.61	0.51	0.34
	Injectable	35.50	0.76	0.57
	Condom	10.97	0.45	0.26
	Else	14.82	0.55	0.43
Side effect experienced in any month	No	23.17	0.60	0.47
	Yes	19.99	0.64	0.39
Side effect experienced in last month of episode	No	24.60	0.61	0.50
	Yes	14.05	0.57	0.16
Pill				
Side effect experienced in any month	No	11.46	0.49	0.36
	Yes	17.36	0.57	0.33
Side effect experienced in last month of episode	No	14.48	0.53	0.42
	Yes	11.03	0.44	0.10
Injection				
Side effect experienced in any month	No	36.00	0.78	0.67
	Yes	22.51	0.72	0.41
Side effect experienced in last month of episode	No	36.00	0.76	0.67
	Yes	18.21	0.74	0.23

Table 4.14 shows that for episodes of injectable use without side effects the median episode length is 36 months meaning that less than half of episodes have discontinued by this time. Removing the episodes which were discontinued due to other assumed reasons intensifies the impact of side effects on median episode length and probability of discontinuing. Figures 4.9 and 4.10 illustrate this by showing the increased divergence, compared to figures 4.7 and 4.8, in the cumulative survival curves between those with and without side effects in the last month of the episode for pill and injectable episodes respectively. This means that the effect of experiencing side effects on the probability of discontinuing is greater among those who do not have

another overriding reason to discontinue, such as wanting to get pregnant. This result suggests that the assumptions made concerning reason for discontinuation are valid.

Figure 4.9: Plot of Cumulative Survival Function by Experience of Side Effects for Episodes of Pill Use with Reason for Discontinuation Assumed

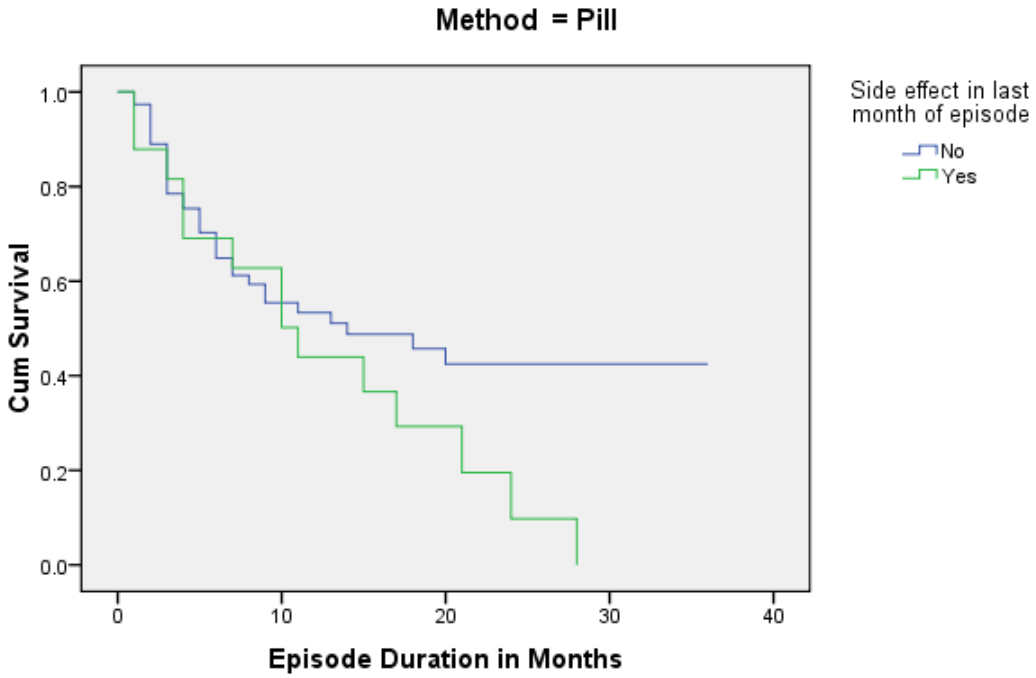
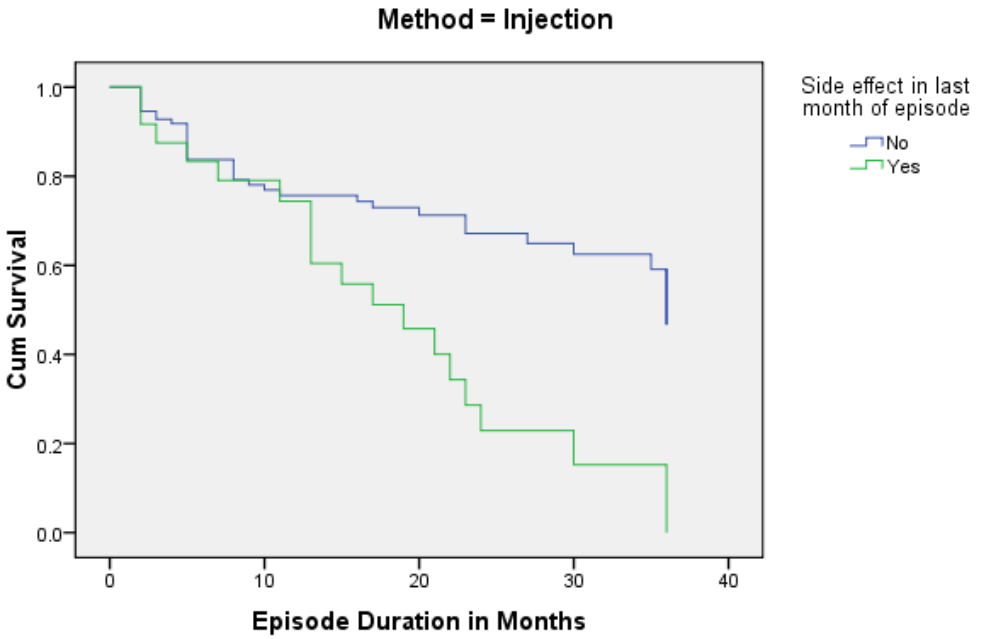


Figure 4.10: Plot of Cumulative Survival Function by Experience of Side Effects for Episodes of Injection Use with Reason for Discontinuation Assumed



4.4.3: Multiple Multilevel Logistic Regression Results

The life table results presented in the previous chapter show that there is an association between the experience of side effects and median duration of episodes, and that this relationship may differ according to method. To further explore this relationship and to quantify the predictive power of the experience of side effect on episode discontinuation a logistic discrete-time hazards model was fitted. The first stage in the model selection was to examine the relationship between the probability of discontinuation in any given month and the experience of side effects. Duration of episode is also included in the model to allow the baseline hazard to vary with time. The results of this model are presented in table 4.15 below. The side effects variable used is the original calendar variable recoded so that it equals 1 if a side effect did occur in a given month and 0 if not, as such the experience of side effects is allowed to vary across the episode.

Table 4.15: Results of Logistic Discrete-time Hazards Model with Side Effects as Sole Explanatory Variable

Variable	Category	β	SE(β)	Sig.	Exp(β)
Duration	0-6	0			1.00
	7-12	-.279	.118	.018	.757
	13-24	-.588	.127	.000	.556
	24+	-1.467	.222	.000	.231
Side effect experienced	No	0			1.00
	Yes	1.095	.137	.000	2.990
Constant		-2.674	.073	.000	.069
Cox & Snell R Square = .072					

Table 4.15 shows that as expected the odds of a discontinuation in any given month decrease significantly as the duration of the episode increases. The results also show that side effects are a significant predictor and the odds of a discontinuation is almost three times higher if a side effect is experienced than if it isn't. The next stage of the model selection is to control for other covariates and determine which are to be included as main effects. The model selection was carried out using forward selection based on the

likelihood ratio test as described in the methods section. The model at this stage contains main effects for, duration, side effects, method, being encouraged by a health worker and number of children ever born. The remaining covariates were not significant at the 5% level and were not included. The coefficients for the main effects model are shown in table 4.16.

Table 4.16: Results of Logistic Discrete-time Hazards Model Main Effects

Variable	Category	β	SE(β)	Sig.	Exp(β)
Episode Duration	0-6	0			1.00
	7-12	-.153	.120	.202	.859
	13-24	-.320	.130	.014	.726
	24+	-1.014	.227	.000	.363
Method	Pill	0			1.00
	Injection	-.623	.145	.000	.536
	Condom	.282	.170	.097	1.326
	Other	-.083	.132	.529	.920
Children ever born	None	0			1.00
	1 or 2	-.165	.204	.421	.848
	3 or 4	-.542	.208	.009	.581
	5+	-.608	.211	.004	.545
Side effect experienced	No	0			1.00
	Yes	1.250	.146	.000	3.490
Encouragement given by a health worker in any one or more months of the episode	No	0			1.00
	Yes	-.853	.114	.000	.426
Constant		-1.913	.216	.000	.148
Cox & Snell R Square = .030					

Table 4.16 shows that once the other variables are in the model the effect of duration on the odds of discontinuing is significantly attenuated and there is no longer a significant difference between episodes of 7-12 months duration and the baseline of 0-6 months. There is a significant difference between pill and injectable episodes with injectable users having lower odds of discontinuing than pill users which is in line with the life table findings. The odds of discontinuation decrease as number of children ever born increases, however the difference between 1 or 2 children and none is not significant. Those episodes in which encouragement was received from a health worker during the episode are almost 6 times less likely to end in a discontinuation

than where no encouragement was given. Finally the odds ratio of discontinuation with side effects compared to without side effects remains significant and is slightly increased.

The final stage in the fixed effects model is to include interaction terms to allow for differing relationships between the explanatory and outcome variables over time. Two interactions proved to be significant, duration of episode and side effects and duration of episode and encouragement from a health worker. A third interaction between duration of episode and number of children ever born also significantly improved the overall fit of the model however none of the individual parameters was significantly different from the baseline category. As the interpretation of this interaction is not intuitively strong and in the interest of parsimony this interaction is not included. The final fixed effects model results are shown in table 4.17. The only major change in the model after the inclusion of the interaction terms is that the main effect for the experience of side effects is no longer significant. This coefficient does not retain any interpretation as a main effect so this variable will be interpreted through calculating predicted probabilities which include the interaction terms. The final step in the model selection is to include a random intercept term to the model to control for any unobserved correlation caused by the multiple episodes per women in the dataset.

Table 4.18 shows the model coefficients after the intercept has been allowed to vary randomly across women level. Although some of the coefficients vary slightly in magnitude there are no significant differences in the model after the random effect has been added. The random parameter itself is significant at the 5% level according to the rough Wald test value which is 2.33. This means that there is significant unexplained variation in the outcome at the individual level.

Table 4.17: Results of Logistic Discrete-time Hazards Model Main Effects and Interactions

Variable	Category	β	SE(β)	Sig.	Exp(β)
Episode duration	0-6	0			1.00
	7-12	-.433	.149	.004	.648
	13-24	-.584	.168	.001	.558
	24+	-1.859	.392	.000	.156
Method	Pill	0			1.00
	Injection	-.610	.146	.000	.543
	Condom	.284	.171	.096	1.328
	Other	-.042	.133	.749	.958
Children ever born	None	0			1.00
	1 or 2	-.154	.205	.454	.858
	3 or 4	-.501	.208	.016	.606
	5+	-.586	.211	.006	.557
Side effect experienced	No	0			1.00
	Yes	.807	.235	.001	2.242
Encouragement given by a health worker in any one or more months of the episode	No	0			1.00
	Yes	-1.381	.206	.000	.251
Episode duration * Side effect experienced	0-6 * yes	0			1.00
	7-12 * yes	.547	.354	.123	1.728
	13-24 * yes	.737	.354	.037	2.089
	24+* yes	2.409	.557	.000	11.123
Episode duration * Encouragement given by a health worker in any one or more months of the episode	0-6 * yes	0			1.00
	7-12 * yes	.895	.285	.002	2.446
	13-24 * yes	.686	.300	.022	1.986
	24+* yes	1.248	.504	.013	3.484
Constant		-1.804	.217	.000	.165
Cox & Snell R Square = .034					

Residual plots were created to check the assumption of normality and constant variance among the level two residuals and are shown in appendix 4D.

Table 4.18: Results of Logistic Discrete-time Hazards Model Fixed Effects with Random Intercept

Variable	Category	β	SE(β)	t-value	Exp(β)
Episode Duration	0-6	0			1.00
	7-12	-0.326	0.154	-2.12	0.72
	13-24	-0.401	0.177	-2.27	0.67
	24+	-1.576	0.409	-3.85	0.21
Method	Pill	0			1.00
	Injection	-0.665	0.160	-4.16	0.51
	Condom	0.285	0.188	1.52	1.33
	Other	-0.060	0.147	-0.41	0.94
Children ever born	None	0			1.00
	1 or 2	-0.198	0.232	-0.85	0.82
	3 or 4	-0.564	0.236	-2.39	0.57
	5+	-0.655	0.240	-2.73	0.52
Side effect experienced	No	0			1.00
	Yes	0.829	0.248	3.34	2.29
Encouragement given by a health worker in any one or more months of the episode	No	0			1.00
	Yes	-1.428	0.218	-6.55	0.24
Episode Duration * Side effect experienced	0-6 * yes	0			1.00
	7-12 * yes	0.587	0.367	1.60	1.80
	13-24 * yes	0.807	0.372	2.17	2.24
	24+* yes	2.467	0.585	4.22	11.79
Episode duration * Encouragement given by a health worker in any one or more months of the episode	0-6 * yes	0			1.00
	7-12 * yes	0.822	0.297	2.77	2.28
	13-24 * yes	0.605	0.314	1.93	1.83
	24+* yes	1.138	0.528	2.16	3.12
Constant		-1.815	0.243	-7.47	0.16
Random intercept		0.191	0.082	2.33	1.21

The effect of method on the likelihood of discontinuation can be interpreted as a main effect and shows that injection users are 50% less likely to discontinue the episode within 36 months than pill users. The coefficients estimated for condom and other methods are not significantly different from the baseline category of pill use.

Figure 4.11 shows the predicted probability of discontinuation by duration of episode for pill and injectable episodes. The graph shows that for both pill and injection the probability of discontinuation declines steadily as the duration of the episode increases.

Figure 4.11: Probability of Discontinuation by Method and Duration of Episode (all other variables held at baseline category)

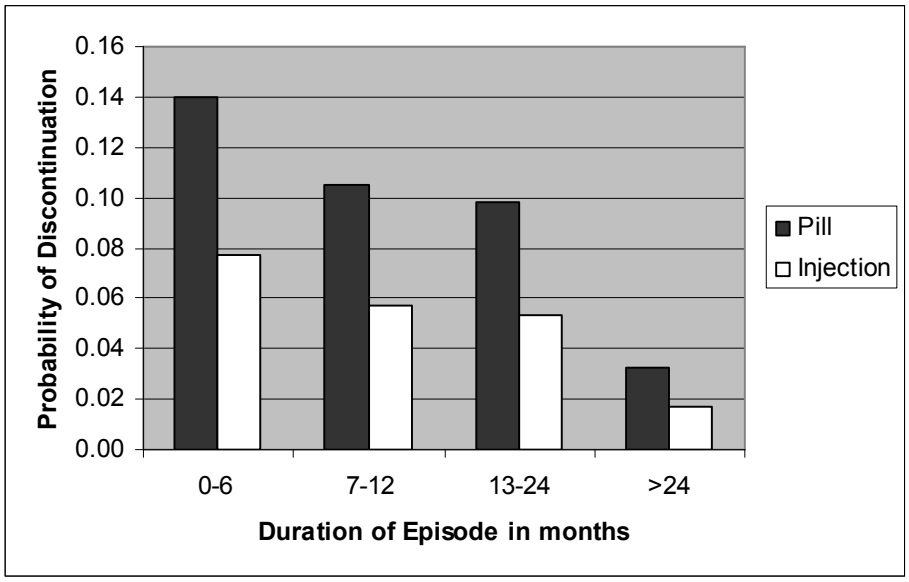


Figure 4.12 shows that as the number of children ever born increases the probability of discontinuation decreases but the difference becomes very small in episodes lasting longer than 24 months. This is what would be expected under the assumption that limiters will on average have longer episodes of use than spacers. Although the '1 or 2' category has a slightly higher probability of discontinuation than the 'none' category in episodes of duration longer than 12 months the difference between these two categories is not statistically significant.

Figure 4.12: Probability of Discontinuation by Number of Children Ever Born and Duration of Episode (all other variables held at baseline category)

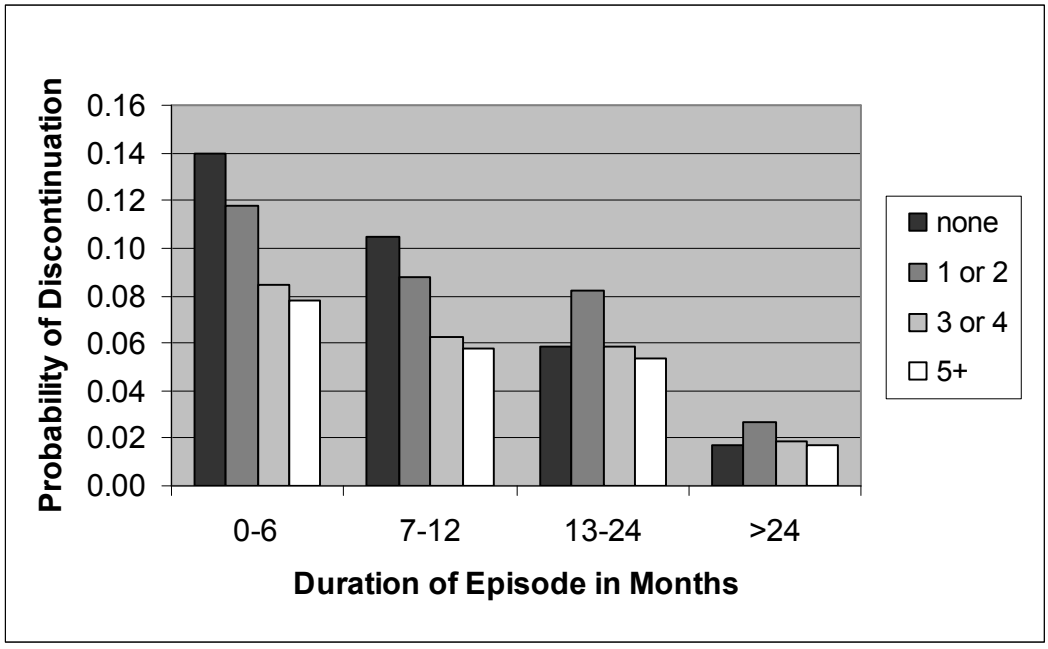


Figure 4.13 shows the interpretation of the interaction between the experience of side effects and the duration of the episode. It shows that where side effects are experienced the probability of discontinuation increases as the episode duration increases, while where side effects are not experienced the probability of discontinuation decreases as the episode gets longer.

Figure 4.13: Probability of Discontinuation by Experience of Side Effects and Duration of Episode (all other variables held at baseline category)

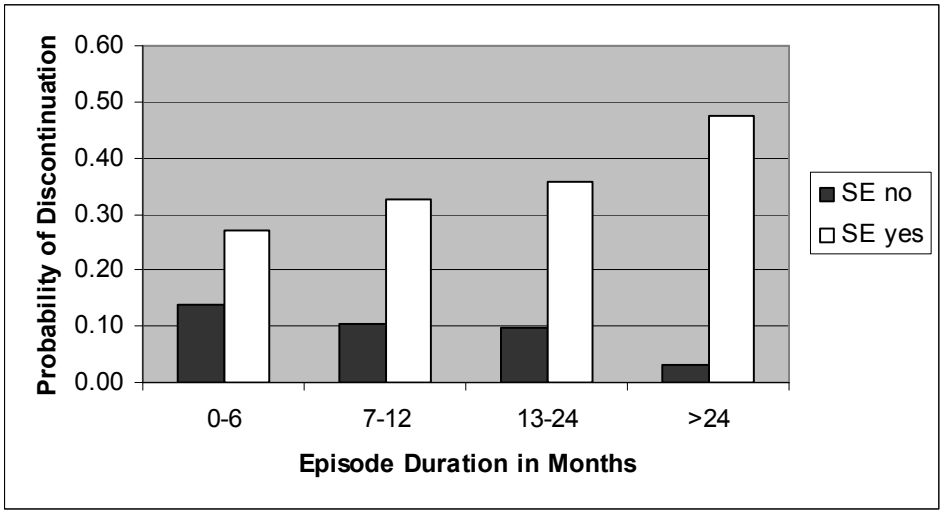
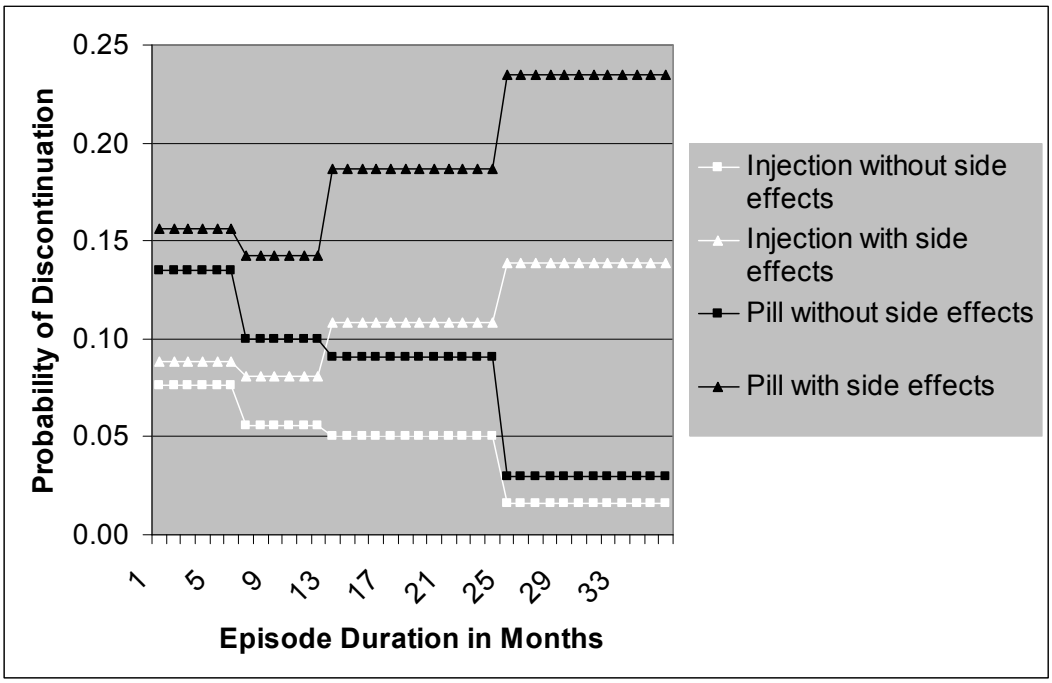


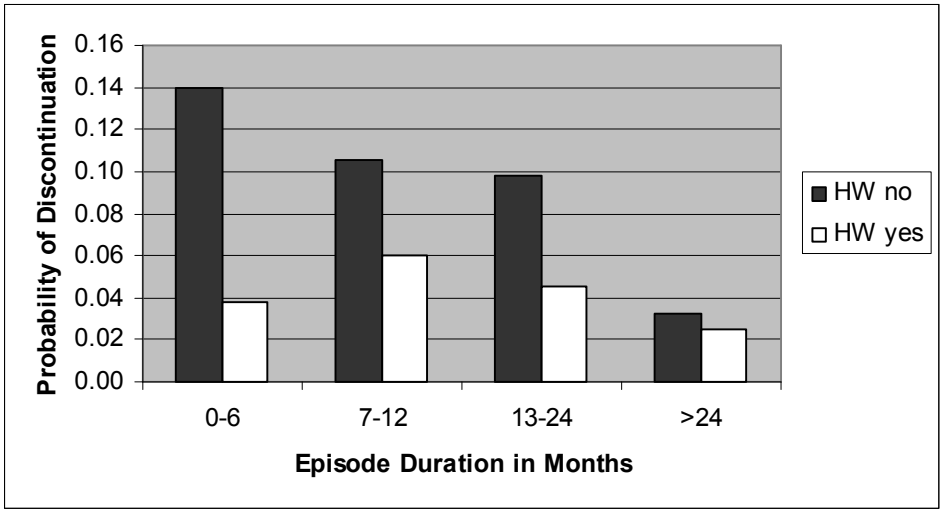
Figure 4.14 shows the same effect for both pill and injectable episodes and shows that the pattern is the same for both methods however the disparity between the probabilities of discontinuing with or without side effects is greater for pill users. It is also worth noting that the probability of discontinuing injection methods with side effects is still less than the probability of discontinuing pill episodes without side effects until 12 months duration. The final variable in the model is being encouraged by a health worker at some point during the episode.

Figure 4.14: Probability of Discontinuation by Method and Experience of Side effects over Duration of Episode (not encouraged by a health worker, 1 or 2 children ever born)



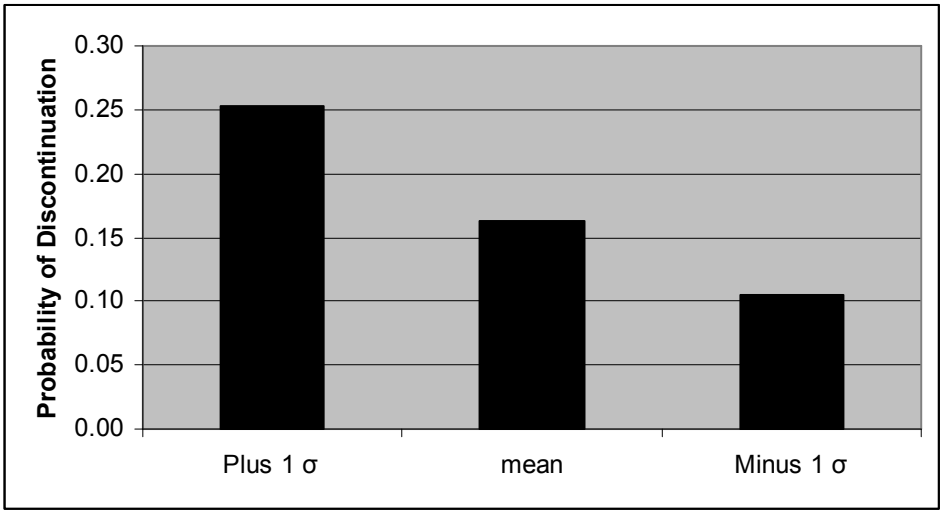
The interaction between being encouraged by a health worker at some point during the episode and episode duration is shown in figure 4.15. This graph shows that in all cases the probability of discontinuation is less for those who do receive encouragement from a health worker than for those who do not. However the magnitude of this effect diminishes with time. For those who do receive encouragement the probability of discontinuing goes up slightly for between 7 and 12 months duration but then decreases with time.

Figure 4.15: Probability of Discontinuation by Encouragement from a Health Worker and Duration of Episode (all other variables held at baseline category)



Finally figure 4.16 shows the effect of the random variance at level 2 of the model which is the individual woman. The graph shows the predicted probability of discontinuation for an average woman, labelled 'mean' and for women one standard deviation above and below average. This shows that the probability of discontinuation varies by 15% between women with different predispositions to discontinuing.

Figure 4.16: Probability of Discontinuation by Random Intercept Variance for minus 1 standard deviation, average and plus 1 Standard deviation. (All other variables held at baseline category)



4.5: Discussion and Conclusions

The results of this study concur with previous studies on the topic and have shown that there is indeed a significant relationship between the experience of side effects and the discontinuation of hormonal contraceptive methods. The importance of this relationship is reinforced by the finding of this study that side effects are relatively rarely reported in association with methods other than the pill and injectable, which together account for over 50% of all methods used in this population. Side effects are most commonly associated with episodes of injectable use which contribute 55% of all months of side effects compared to only 33% associated with pill episodes. This is due to the large contribution of months of the injectable episodes to the dataset by virtue of their longer duration. When looked at as a percentage of the total number of months of use for that method pill and injectable are roughly the same in respect to the reporting of side effects with 11.5% and 10.1% of months with side effects reported respectively.

Also in concurrence with previous studies by far the most frequently reported side effect was menstrual disruption, which accounted for 23% of all the months of side effects experienced. This finding reinforces the opinion of Tolley et al. (2005) that menstrual disruption is a side effect which can have important implication for continuation and should not be dismissed. Other commonly reported side effects were headache, cramp, irregular heartbeat, and dizziness which each contribute more than 10%. As would be expected menstrual disruption was most frequently associated with injectable use while headaches are the most common side effect for pill users.

In terms of the average length of episodes injection episodes last almost double the length of pill episodes, with three quarters of pill users having discontinued by 24 months compared to just over half of injection users. The impact of side effects on the length of episodes is due in part to the fact that in longer episodes there is more chance for a side effect to occur and it

appears that the experience of side effects either has no real effect on episode length or increases the median duration of the episode. When this result is considered more closely it is shown that side effects have a differential effect on length of episode according to method. The length of episodes of pill use is not affected much by side effects and is slightly longer where side effects are experienced. However, the opposite is true for injectables where the length of episodes is significantly shorter when side effects are experienced than when they are not. The result for all methods is most likely being skewed by methods in the 'other' category such as Norplant and IUD which are associated with both, some potential for side effects, and with very long average duration. Where a few users of these methods are experiencing side effects and persisting with use over very long periods this will influence the overall median episode duration. This result highlights the importance of method choice in the issue of side effects and shows that injectable users are more at risk of shortened episodes due to side effects than pill users. This is an important finding given that failure rates are generally lower for injectables than other methods and so it is an important method for overall continuity (Blanc et al., 2002).

One of the limitations of this study previously mentioned is the lack of information on reason for discontinuation. Where possible the calendar data has been used to make assumptions about the reason for the discontinuation of episodes based on reported behaviour at that time. Overall 12% of episodes ended following a month when a side effect was reported, 22% were followed by a pregnancy within 9 months and 26% were at low risk of pregnancy when the episode ended. This leaves 40% of discontinuations unclassified. The effect on the length of episodes of removing the cases where discontinuation was due to desire to get pregnant or low risk of exposure to pregnancy, was to lengthen them in all cases. This makes substantive sense given that those who discontinued within 36 months to get pregnant could reasonably be considered spacers which would mean that after these episodes are removed, the balance of the remaining episodes will be towards

limiters who would naturally have longer episode durations. The proportions of episodes surviving to 12 and 24 months also increase with 57% of injectable episodes and 34% of pill episodes continuing beyond 24 months. The effect of this on the relationship between episode length and side effects was that the differences between median episode length for those with and without side effects became more pronounced. This suggests that those without other reasons for discontinuing are more susceptible to the episode shortening effects of side effects. Although this result is based on big assumptions and must be treated with caution it does suggest that there is some potential value in inferring reason for discontinuation from contemporary behaviour at the time the method was stopped.

In the logistic discrete-time hazards model the experience of side effects was shown to be a significant predictor of discontinuation but the relationship between the two varies with the duration of the episode. In general the probability of discontinuation decreases steadily with time, however where side effects are experienced the probability of discontinuation first declines after 6 months and then increases again after 12 months. At all times the probability of discontinuation is significantly greater if side effects are experienced after controlling for all other variables in the model and unobserved factors at the woman level. The strength of motivation to use a method will vary considerably in episodes of short duration and it is accepted that side effects are more likely to occur in the beginning of an episode and that this leads to high rates of discontinuation in the first 6 months. Once episodes have survived to reach a certain length there is a selection effects whereby only highly motivated individuals are still using while the less highly motivated have already discontinued. The effect of side effects on discontinuation becomes increasingly significant as episode duration increases because those individuals still using after a long duration are highly motivated to use and do not have as many other reasons remaining to discontinue.

It was also investigated whether or not this may be reflecting some sort of cumulative effect whereby multiple months of side effects are experienced throughout a long episode and eventually a limit to the tolerance is reached. This was investigated by including in the model a cumulative measure of how many of the months in a given episode side effects were reported. This variable proved not to add anything significant to the model as there was no statistical difference between any of the coefficients except between having no side effects and having one month of side effects.

Although side effects proved to be very significant as a predictor of episode duration and discontinuation other hypothesized predictors were not all significant. The regression showed that the odds of discontinuing decrease steadily with the number of children ever born but other measures of motivation to avoid pregnancy such as fertility intentions were not significant. Similarly all of the socio-economic variables were insignificant as predictors of discontinuation. This supports the statement by Tolley et al. (2005) that it is not possible to identify high risk groups for discontinuation on the basis of socio-economic characteristics. Among the communication variables only one proved to be significant and that is receiving encouragement from a health worker. In contrast to what was found by Porter (1984) being discouraged from using a method seems to have no effect on discontinuation in this study. Receiving encouragement from a health worker overall significantly decreases the odds of discontinuing but as with side effects this effect differs across time. The influence of encouragement by health workers on the probability of discontinuation is particularly great in the first six months and then declines proportionally over time.

Method choice does play a significant role in the probability of discontinuation and at all points throughout an episode the probability of discontinuing is lower for injectable users than for pill users. This reflects attributes of the method itself which may influence the likelihood of discontinuation. The pill is administered in a way in which is totally under

the control of the user and which requires a conscious daily decision to continue. For this reason it is easy for users to discontinue the pill, either because they have a specific reason, or through ambivalence and inaction. In either scenario the user has the ability to discontinue immediately. The injectable on the other hand (and to an even greater extend, the IUD and implants) are not under the daily control of the user. This can be a benefit as the user does not have to make daily decisions regarding their contraceptive, however it also 'disempowers' women and places some of the control in the hands of the service provider. This leads to a lower probability of discontinuation overall and potentially to more considered and drawn out process of discontinuation.

4.5.1: Policy Implications

This study emphasizes what others have found in that counselling from health workers is extremely important in minimizing discontinuation rates. The results show that health worker encouragement has the largest effect in the first 6 months but discontinuations with side effects still occur at longer episode durations. Therefore counselling and encouragement from health workers must be continued even once episode duration is long. Both pill and injection users should be given attention as both methods attract the same proportion of side effects however the average length of injection episodes is much longer suggesting that injection users are more likely to tolerate the side effects. Given that menstrual disruption is the most likely side effect with injectable use this suggests that with sufficient motivation and counselling this is a side effect which does not have to lead to discontinuation. These results also show that once a method has been adopted negative communication has little role in discontinuation so efforts should be focused on overcoming fear of side effects as a barrier to the initial adoption. As pointed out by Ali & Cleland (1999) the process of contraceptive discontinuation is complex and multi dimensional and cannot be easily predicted based on the characteristics of the user of the episode. As such

service providers should as far as possible treat each case as individual and have the flexibility to respond to the changing needs of users as they progress through each episode of use.

4.5.2: Future study

The wealth of data collected by the CCFCS leaves much scope for further study in this area. Including the men's data into the study would be an obvious next step to determine if anything in the husband's characteristics is associated with discontinuation. It would also be illuminating to model the occurrence of side effects as the outcome variable to determine if there is anything discernable about the individual which makes them more susceptible to side effects, or more likely to report symptoms as side effects. Finally multi-state models could be used to include multiple transitions and periods of non-use. In this way the individual could become the unit of analysis rather than the episode and each individual's propensity to experience side effects and to discontinue could be examined across multiple episodes, using different methods and including periods of non-use and other reproductive behaviour across the whole study period.

Chapter Five

Future Intentions and Fear of Side Effects: Ghana DHS Data

5.1: Introduction

This study investigates the association between exposure to family planning information, through mass media and interpersonal channels, and the probability that a respondent will cite fear of side effects as her main reason for not intending to use a contraceptive method in the future. The literature proposes that exposure to mass media messages promoting family planning may reduce fear of side effects by providing trustworthy information (Barber & Axinn, 2004). Discussing family planning with others is also shown to be associated with an increased probability of current use (Bawah, 2002; Westoff & Bankole, 1997; Olaleye & Bankole, 1994); however interpersonal communication could also be working to increase fear of side effects as negative personal experiences, rumours and misinformation can also be spread through a social network. If this is the case interpersonal communication about family planning may be acting both to facilitate and to deter method use. Therefore estimates of the positive association between interpersonal communication and current use of a contraceptive method at the aggregate level may in fact be attenuated by the negative impact of such communication on some individuals. This study will determine if this negative impact is observable through a positive association between discussing family planning and being afraid of side effects.

The data analyzed are a sub-sample of women aged 15-49 years from those asked the individual women's questionnaire of the 2003 GDHS. Respondents included in the study are those who are not currently using any form of contraception and who state that they do not intend to do so in the future. The method employed is multiple logistic regression

modelling, used to determine which variables explain variation in the probability of fear of side effects being the main reason for not intending to use a contraceptive method in the future.

5.1.1: Research Questions

This study aims to use GDHS 2003 data to explore the fear of side effects as a reason for current non-use of contraceptives by all women aged 15-49 years. The research questions addressed are:

- What are the socio-economic characteristics of women who say that fear of side effects is their main reason for non-use of contraception?
- Does the probability of women citing fear of side effects as their main reason for not intending to use contraception vary according to their exposure to family planning information?
- If so, what is the magnitude and direction of the effect for different types of information source?

5.1.2: Conceptual Framework

Figure 5.1 shows a diagrammatic representation of the conceptual framework of this study. Each individual has certain background socio-economic and demographic characteristics, which together with past experience and information about family planning received from a variety of sources, feed into the decision making process. This decision making process results either in deciding to use a method of contraception or not to use a method. One of the reasons not to use may be fear of side effects and this can be strong enough to result in the intention not to use a method in the future for the same reason. According to the framework it is also possible for an individual to decide not to use for any other reason and this also may translate into intention not to use in the future.

Figure 5.1: Conceptual Framework Diagram

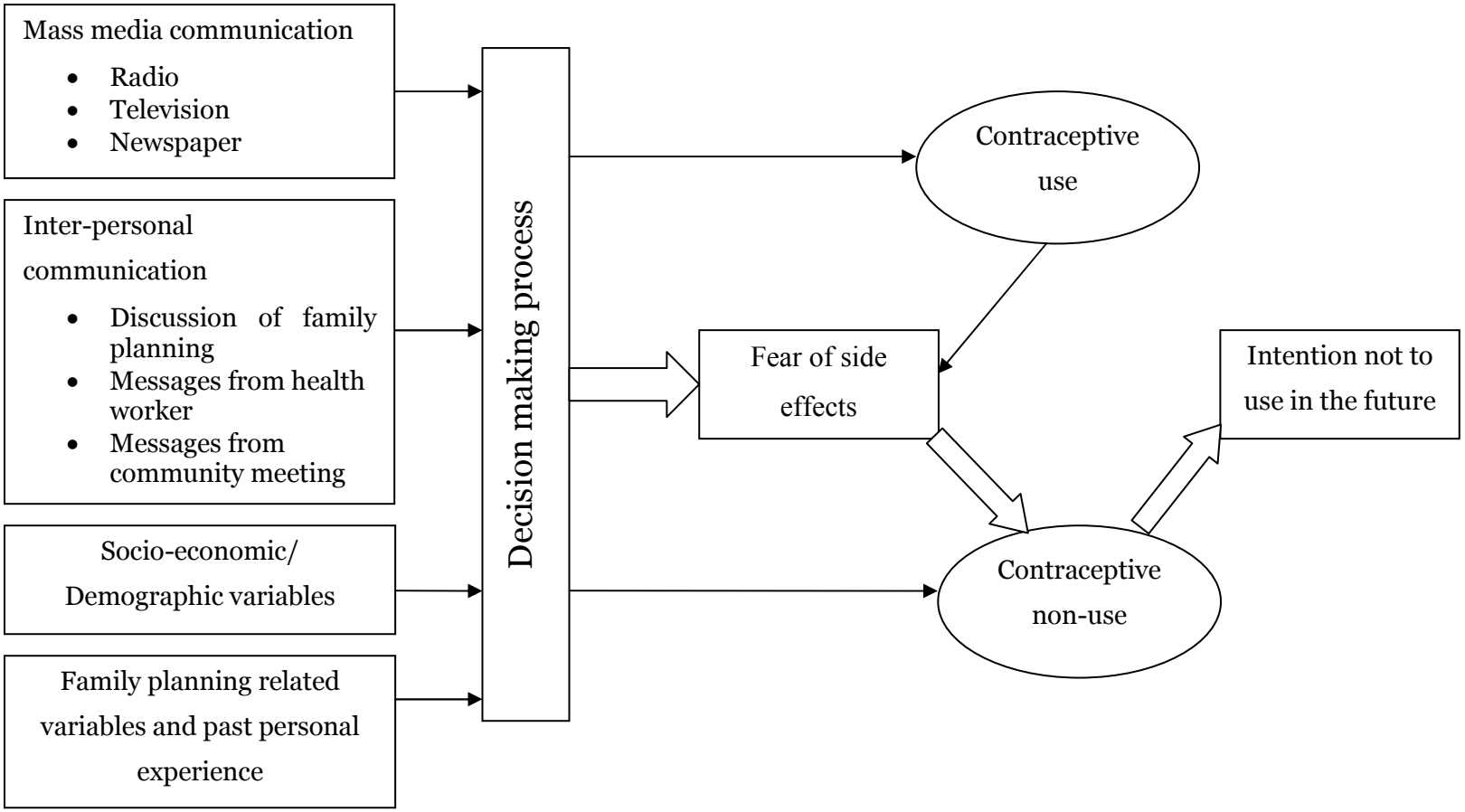


Figure 5.1 also shows that where a method is adopted it may then be discontinued due to actual or perceived side effects and a fear of side effects and intention not to use is created in this way. It is worth noting that for those not currently using and/or not intending to use in the future the decision making process may be very passive as the end result is inaction and the maintaining of the individuals current status quo with respect to contraceptive use. In fact it could be argued that in some cases there is no conscious decision making process at all and this stage of the framework is skipped altogether. However the implication of this framework is that those individuals would be unlikely to cite fear of side effects as their reason for not using a method as that does imply some sort of evaluation of information and thought process on the matter.

5.1.3: Study Limitations

One of the major limitations of this study is that it is not possible to place any of the events recorded into a temporal framework due to the cross sectional design of the survey. This is a common limitation suffered by all studies based on cross sectional surveys and it means that the results can be interpreted as associations only rather than making any causal inference. For example, in this study it is equally possible for an individual to develop a fear of side effects based on what they have observed in their community and then subsequently have their first ever discussion about family planning. Therefore we cannot conclude that in this case discussing family planning causes fear of side effects and it is not possible to determine a causal sequence of events in this study.

Another potential limitation of this study is the lack of inclusion of men or of husband's characteristics. As the sample contains unmarried women, husband's characteristics could not be included. This is expanded on further in section 5.3.1.3, but it was felt to be acceptable given that the question on which the response variable is based is related to future intentions and therefore husband's characteristics current to the time of the survey are less salient. Men undoubtedly do have an important role in

the spread of family planning information and in the experience of fear of side effects. However, when it comes to reasons for non-use their influence really operates through the women's perceptions, for example the woman is able to report if it is the husband's disapproval which causes her not to intend to use contraception in the future. Similarly it is the women themselves who experience side effects and it is their perception of these issues which is the focus of this study.

A final limiting factor of this study is the nature of the questions on which the response variable in this study is based. There is some uncertainty over the reliability of survey questions which ask respondents about their intentions regarding future reproductive behaviour. In general hypothetical questions where 'respondents are asked to make predictions about their own future behaviour or reactions' (Oppenheim, 1992: 126) should be avoided as although they represent the state of mind of the respondent at the time of the survey they may not always match to the future behaviour, especially where the question is asking about something the respondent has never experienced. In this case the response variable in the GDHS2003 is based on two such questions. First the respondent is asked 'Do you think you will use a contraceptive method to delay or avoid pregnancy at any time in the future?' and if the response is yes this is followed up with 'What is the main reason that you think you will not use a contraceptive method at any time in the future?' (Ghana Statistical Service, 2004: 344-345). Both of these questions are asking the respondents to predict their future behaviour and not only for one point in time in the future but for the entire 'future' which may be difficult for the respondent to answer accurately.

In addition to this the question is field coded by the interviewer which could lead to some bias being introduced at the data collection stage. The instruction given to interviewers in the DHS manual regarding field coding this question are presented in appendix 5A. To determine if the interviewer was influential to the results of this study the final model was refitted as a multi-level model to see if there was any significant variation

in the response variable according to interviewer. In total there were 52 different interviewers who each interviewed between 1 and 102 respondents in this data set. When the intercept of the model was allowed to vary randomly according to interviewer the value of the random intercept term was 0.279 with a standard error of 0.149. Based on a rough t-test this term is not significantly improving the model. The parameter estimates for the rest of the model are very similar to those without the random effect added and so it was concluded that for the purpose of this study there is not a significant interviewer effect on the response variable and the multi-level model was not pursued further.

5.1.4: Structure of Chapter

This chapter is presented in five sections, the first of which has already outlined the research questions and the conceptual framework of the study as well as its' limitations. The second section presents relevant results from some of the previous studies done in this area and this is followed by a detailed description of the data set, the study variables and the statistical methods used. Section four presents the results, beginning with the preliminary data analysis, and then looking at bivariate associations and finally the logistic regression. The fifth and final section of the chapter is a discussion of the findings of this study and some of the conclusions which can be drawn.

5.2: Previous Studies

Non-use of contraceptives among women who wish to delay or limit their child bearing is a serious problem with repercussion for the reproductive and general health of the population as well as for the national fertility rate. Singh et al. (2003) showed that in developing countries as a whole one-third of all unintended pregnancies are among women using a modern or traditional contraceptive method, and two-thirds are among women using no method at all. The majority of these unintended pregnancies end in abortion and in developing countries most abortions are unsafe (Sedgh et al., 2007a), this creates a serious public health problem and potentially raises the level of maternal mortality with severe impacts on families and the wider society. A comprehensive study based on DHS surveys from 53 developing countries Sedgh et al. (2007b) concluded that among women who cited concerns about side effects of contraception, the level of intention to use family planning was lower than the national average in every country in the study. This issue needs further attention as studies have shown that intention to use is a strong predictor of actual future behaviour (Curtis & Westoff, 1996).

Many studies show that women commonly cite fear of side effects as a reason for not using contraception (Mwageni et al, 1998; Lutalo et al, 2000; Schuler et al, 1994). In the study by Sedgh et al. (2007b) reasons for non-use into are grouped three broad categories:

1) Those related to program provision, including poor access, cost, lack of knowledge and method related reasons, one of which is health concerns or fear of side effects.
2) Reasons indicating that the woman perceives she is at low risk of getting pregnant.
3) Opposition to family planning.

Sedgh et al. (2007b) found that in 6 countries in sub-Saharan Africa[13] method-related concerns were the reasons for not intending to use contraception for more than a third of married women with unmet need. The study also went on to determine that among women with unmet need, those living in urban areas were more likely to cite a fear of side effects as a reason for not using family planning (Sedgh et al., 2007b). Additionally in some countries, including Ghana, it is the relatively well-educated among women with unmet need who are not using for this reason (Sedgh et al., 2007b). A study by Nair and Smith (1984) compared reasons for non-use of contraception in 6 countries using data from the Contraceptive Prevalence Survey which was the precursor to the DHS. The study looked at currently married non-pregnant women aged 15-44 years and asked them the main reason for not currently using a method. The study found that fear of side effects/health reasons was more frequently cited in the 25-39 year age group and increased with number of living children.

There appears to be a strong link between past use of contraception and current non-use due to fear of side effects, suggesting that negative personal experiences are influencing fear of side effects. Sedgh et al. (2007) found that in 24 of the 34 countries they studied, women who had used contraception in the past were more likely than those who had not, to give program-related reasons for non-use. This suggests that past personal experience with a method may play some role in influencing fear of side effects and other studies have found similar results. Nair and Smith (1984) also found that a significantly higher proportion of the 'ever users' compared with the 'never users' cite side effects/health reasons as their main reason for not using contraception.

Other authors have questioned the extent to which side effects are experienced and a study, based in urban Sudan (Swar-Eldahab, 1993), also included 'ever use' of contraceptives as a determinate in non-use. The survey based study found that over 40% of respondents linked their

[13] Ghana, Kenya, Lesotho, Madagascar,Malawi and Tanzania

current non-use of contraceptives to real or perceived side effects but only about one quarter of those had actual past experience of side effects. The study reached the conclusion that in this case 'side effects of contraceptive use are more often assumed than actually experienced' (Swar-Eldahab 1993:370).

Regardless of whether the side effects are real or perceived these studies imply that where individuals have had contact with service providers their needs have not been met and they may have been left at risk of an unintended pregnancy. Sedgh et al. (2007: 37) suggest that these women have not 'obtained services of sufficient quality to help them cope with the specifics of contraceptive use.' Insufficient counseling, inadequate methods and a limited range of methods are all factors related to the quality of service provision which can influence a woman's future contraceptive intentions.

Diffusion of innovation theory states that communication is essential and primary to the decision-making process and therefore, whether through mass media or other channels can affect the behaviour of individuals (Rogers, 1983). Studies' focusing on the determinants of contraceptive use show that exposure to information on family planning through mass media channels increases the likelihood of modern method use (Westoff & Bankole, 1997; Olaleye & Bankole, 1994). Exposure to mass media may therefore affect people's behaviour in a number of different ways by increasing knowledge and correcting information (Barber & Axinn, 2004). It could be inferred from these findings that exposure to mass media might lessen the fear of side effects by providing correct and trustworthy information, however, people may be affected in different ways according to their predisposition to use contraception and the association may not be so simple.

Many authors agree that mass media is effective at creating awareness and knowledge of innovations, but interpersonal communication is necessary for actual behaviour change (Hornik & McAnany, 2001; Valente et al, 1995; Valente et al, 1996). Interpersonal communication can create a climate for open discussion (in this case of the potential health effects of contraceptive use) and prompt people to consider adopting a new behaviour (Hornik & McAnany, 2001). Studies have considered the effects of spousal communication on contraceptive behaviour and found that it is a significant predictor of contraceptive use (Olaleye & Bankole, 1994: Bawah, 2002). In contrast to mass media communication it is not necessarily reasonable to assume that inter-personal discussions are communicating positive information and this may be a route for the transmission of myths and rumours. Therefore it is possible that exposure to information from interpersonal discussion may actually increase the likelihood of fear of side effects in non-users.

Fear of side effects is often attributed to misinformation and rumours regarding the possible effects of modern methods (El-Qaderi & Al-Omari, 2000-2001; IPPF, 2009). A focus group conducted as part of a study of contraceptive use in Rakai District in Uganda (Lutalo et al, 2000) found that while most participants understood the concept and goals of family planning, 'misconceptions occurred about the potential health risks of contraceptives, particularly with respect to adverse effects on fertility or the health of future children' (Lutalo et al, 2000: 224). Participants emphasised the health risks to users and did not usually associate family planning with potential health benefits to mothers.

Nair & Smith (1984) used discriminant analysis which showed that overall age, number of living children and ever use of family planning were the most powerful discriminators of reason for non-use, however a high rate of correct classification was not achieved. Based on this result the author's propose that women may have more than one reason for non-use and instant evaluation at the time of the interview of the relative importance of these reasons might have been necessary. They also suggest that reasons

for non-use may not be rational as the behaviour in question is inaction rather than action which may not have an associated rational decision-making process (Nair & Smith, 1984). However, Campbell et al. (2006) point out that in places where misinformation about side effects is common women who chose not to use for this reason are in fact making a rational decision.

5.3: Data and Methods

5.3.1: Data

The data used for this analysis is a sample taken from the 2003 Ghana Demographic Health Survey (GDHS). The Demographic Health Surveys (DHS) project mission is 'collecting and analysing reliable demographic and health data for regional and national family planning and health programs' (Measure DHS, not dated). The DHS is a worldwide research project initiated by US Agency for International Development (USAID) and has been operating since 1986 when it succeeded the World Fertility Survey. Surveys have been conducted in Ghana in 1988, 1993, 1998 and 2003 being the most recent. One of the primary objectives of the 2003 GDHS was 'to provide current and reliable data on family planning behaviour' (Ghana Statistical Service, 2004).

The 2003 survey used a two-stage sample design beginning with the selection based on probability proportional to size, of 412 census enumeration areas (EAs). All households in these EAs were then listed and a systematic sample of households, 15, 16 or 20 depending on the region, was drawn from each. The resulting sample is a representative sample from which generalizations to the population can be made. Within each household all women aged 15-49 years and all men aged 15-59 years who were usually resident in the household or who had spent the night preceding the survey in the household were eligible for interview. Data was collected between 01\07\2003 and 01\10\2003 and three questionnaires were used, household, individual women and individual men. Interviews were completed in 6251 households, with 5691 women and 5015 men with response rates of 99%, 96% and 94% respectively. The individual women's questionnaire is used for this analysis and the data were obtained electronically from ORC Macro through the Measure DHS website in standardized recode format.

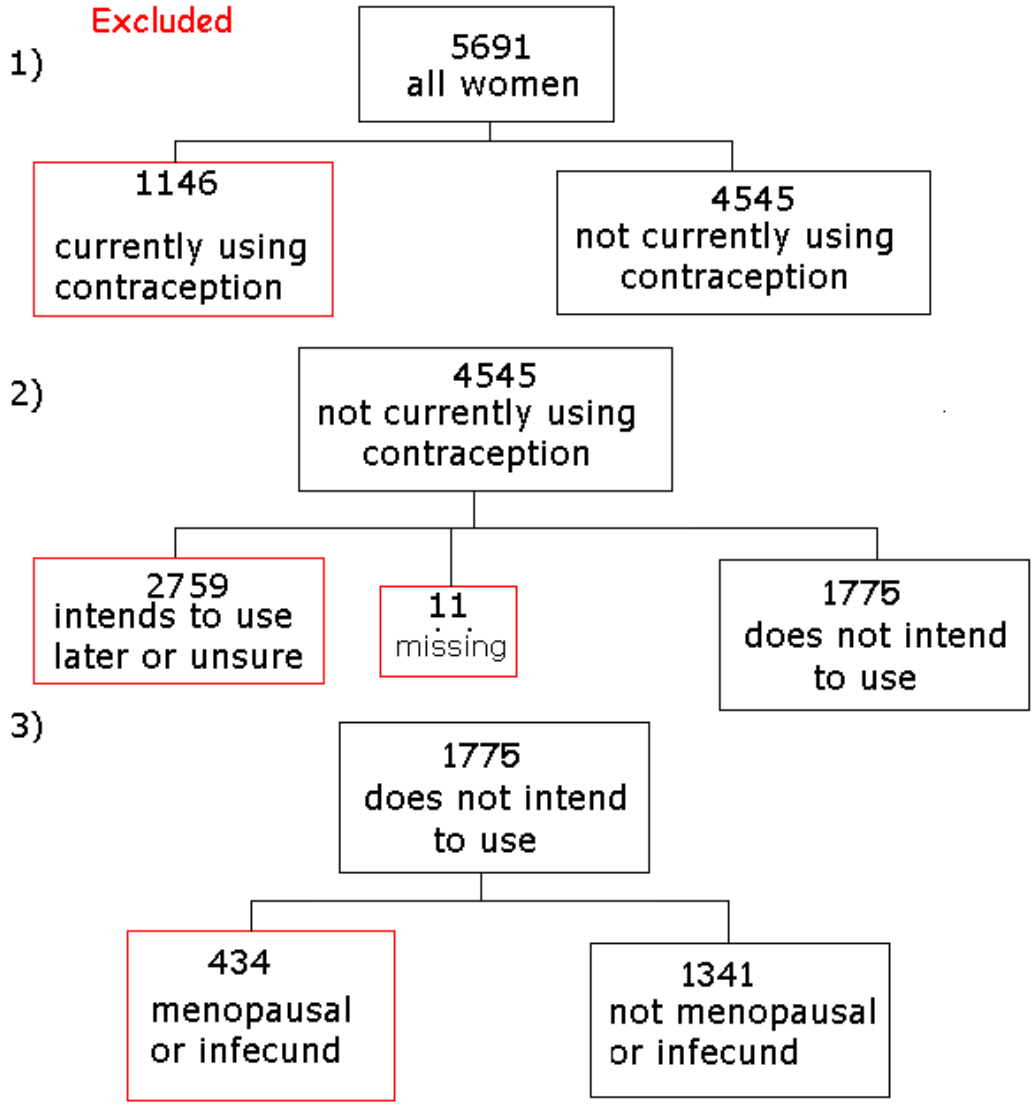
5.3.1.1: Selection of Cases

A sub-sample was drawn for analysis so that only those who might reasonably be prevented from using a method by their fear of side effects are included in the model. The sample was drawn in the following stages:

1) 1146 current contraceptive users identified as those who responded 'yes' to the question 'Are you currently doing something or using any method to delay or avoid getting pregnant?' were excluded from the sample.
2) The remaining women were then asked 'Do you think you will use a contraceptive method to delay or avoid pregnancy at any time in the future?' Those 2759 women who responded in any way other than 'does not intend to use' to this question were also excluded from the sample. The sample is necessarily restricted up to this stage of selection by the nature of the data. The question upon which the response variable in this study is based was only asked of the 1775 respondents who remain in the sample at this stage. Therefore it would not have been possible to include any of the respondents excluded up to this point even if desired as they were not asked the required question.
3) The response of interest is based on a prospective question of future intentions so status at the time of the survey on variables such as currently pregnant or current sexually activity, which may change at any time in the future, should not affect future intentions with regard to contraceptive use. Those who are menopausal or infecund at the time of survey are not exposed to the risk of pregnancy and this is a status unlikely to change in the future. Therefore their future intentions towards contraceptive use are likely to be heavily influenced by their current status. 434 women were excluded from the sample on this basis and were identified using the DHS constructed variable for exposure to the risk of pregnancy.

The final sample at this stage consists of 1341 women who are not menopausal or infecund, are not currently using a contraceptive method, and say they do not intend to use a contraceptive method at any time in the future. Figure 5.2 is a diagrammatic illustration of the sub-sampling process.

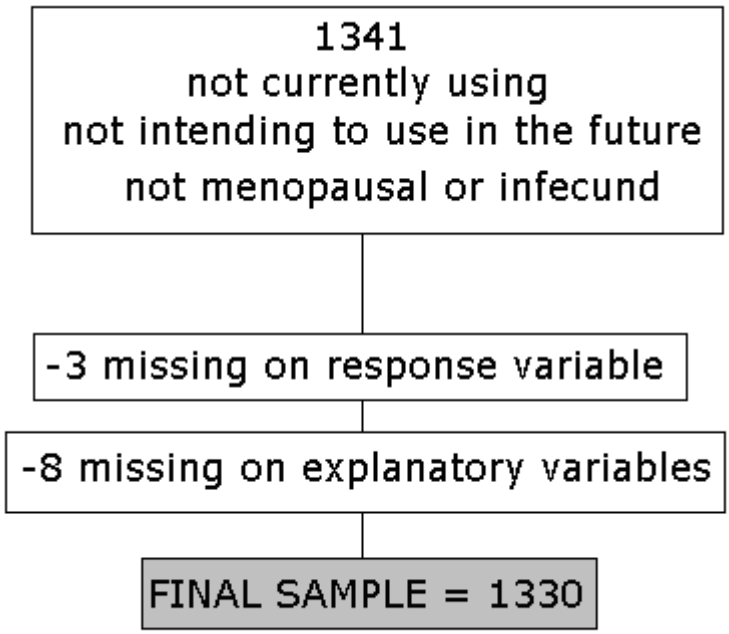
Figure 5.2: Diagram of Sample Sizes and the Sub-sampling Process



5.3.1.2: Missing Data

Figure 5.1 above shows the number of cases excluded from the sub sample due to missing data on two of the variables used to select the sub-sample. In total 11 cases were unable to be selected into the sample on the basis of missing data. A further 11 cases were removed from the sample due to missing data on one or more of the variables to be used in the statistical modelling as shown in figure 5.3. It was felt acceptable to delete these 22 cases on the basis that they constitute only 0.39% of the original sample or 1.65% of the sub-sample. The final sample is 1330 respondents who are not current contraceptive users, say they do not intend to use a method in the future and give a main reason for not intending to use. The sub-sample does not contain any missing data cells.

Figure 5.3: Diagram of Missing Data Exclusion



5.3.1.3: Description of Sample

As mentioned previously exclusions from the sample were not made on the basis of current exposure to the risk of pregnancy other than for those who are menopausal or infecund. Therefore the selected sub-sample contains some individuals who were not exposed to the risk of pregnancy at the time of the survey but who are potentially going to be exposed to the risk of pregnancy in the future. This includes pregnant women, amenorrheic women, those who have never had sex and those who are not sexually active at the time of survey. The frequency of these characteristics in the sample is shown in table 5.1.

Table 5.1: Factors Effecting Exposure to Pregnancy at the Time of Survey*

	Frequency	Percent (N= 1330)
Currently pregnant	93	7.0
Never had intercourse	237	17.8
Not active in last 4 weeks	578	43.5
Amenorrhea	183	13.8

*respondents can be in more than one category at a time.

Due to the current risk of exposure to pregnancy not being a pre-requisite for inclusion in this study 503 unmarried women are retained in the sample. Of those, 378 are never married and 125 are formerly married. Although marriage patterns do have an important influence on fertility and contraceptive use through their association with exposure to sexual intercourse, in settings like Ghana, where exposure to sexual intercourse occurs outside of marriage, it is important to examine information that directly measures sexual behaviour rather than relying on marital status as a proxy for exposure (Blanc & Grey, 2000). In some societies in Ghana the concept of nuptuality is not clear cut and no social stigma is attached to pre-marital conception and it is therefore not an uncommon event (Awusabo-Asare, 1988). Exposure to risk of pregnancy and potential to be a contraceptive user is therefore not restricted to married women and it is not appropriate to use marital status as a proxy for exposure (Blanc & Grey, 2002). This point is examined for this sample in table 5.2 which

shows the cross tabulation of marital status by recent sexual activity in the sub sample drawn for analysis.

Table 5.2: Cross Tabulation of Marital Status by Recent Sexual Activity

Marital status	Never had intercourse	Active in last 4 weeks	Not active in last 4 weeks	Total
Never married	236	34	107	377
Currently married	1	464	363	828
Formerly married	0	17	108	125
Total	237	515	578	**1330**

Table 5.2 shows that 141 (37.4%) of those who are never married have engaged in sexual activity at some time. This is a significant proportion of women who have been exposed to the risk of pregnancy outside of marriage and given that this sample consists entirely of non-contraceptive users the exposure to the risk of pregnancy is even greater. Given this finding and to prevent any issues of colinearity in the statistical modelling recent sexual activity will be included as a potential predictor in the model and marital status will not be used.

Including unmarried women in the analysis presents a limitation in that partners' or couples' characteristics such as husbands' education, age or occupation cannot be included as study variables. All unmarried women have missing data for any partners' or couples' characteristics and grouping these into a 'not applicable' category would not make substantive sense when interpreting the results of the analysis. Previous studies in Ghana looking at contraceptive use have found that partners' characteristics are not a significant predictor of contraceptive use (Oheneba & Takyi, 1997; Tawiah, 1997). Based on this it is felt that the exclusion of partners' characteristics will not significantly impact the study of non-use. Inclusion of a variable determining if a marriage is polygamous is also not possible and considering that 23% of married women report that they are in such a union that may have been informative to this study. Given the drastic reduction in sample size if

unmarried women were excluded from the sample it is felt that the benefits from including unmarried women outweigh the limitations brought by their inclusion.

5.3.2: Study Variables

5.3.2.1: Response Variable

The response variable is based on the following question which is asked of all women in the selected sample who are not currently using a contraceptive method and do not intend to use a method in the future:

> What is the main reason that you think you will not use a contraceptive method at any time in the future?

The respondents answer is coded into one of 19 possible categories which are shown below in table 5.3.

Table 5.3: Main Reason for Not Intending to Use a Method

	Frequency	Percent
Not married	78	5.9
Infrequent sex	76	5.7
Menopausal, hysterectomy	20	1.5
Subfecund/infecund	83	6.2
Wants more children	164	12.3
Respondent opposed to family planning	85	6.4
Husband opposed to family planning	30	2.3
Others opposed to family planning	2	.2
Religious prohibition	71	5.3
Knows no method	66	5.0
Knows no source	21	1.6
Health concerns	102	7.7
Fear of side effects	380	28.6
Lack of access	8	.6
Costs too much	18	1.4
Inconvenient to use	14	1.1
Interferes with body's normal processes	24	1.8
Other	31	2.3
Don't Know	57	4.3
Total	**1330**	**100.0**

Table 5.3 shows that despite the removal of menopausal and infecund women from the sample there are still 20 and 83 respondents respectively who give these as a main reason for not intending to use contraception. These respondents obviously self identify with these conditions but do not meet the DHS criteria for inclusion into those groups. As would be expected in the menopausal category the respondents are concentrated in the two highest age groups and are all between 40 and 49 years old. In the infecund/subfecund category there are a few respondents at younger ages but 86% of respondents are aged between 30 and 49 years. As the question being asked concerns future intentions it is also possible that these respondents, while not self identifying or meeting the DHS criteria for menopause or infecundity at the time of survey, believe that in the future this will be the reason they do not need a contraceptive method.

This 19 category variable is recoded into a dichotomous variable where the outcome is coded as 1 if fear of side effects is the main reason for intention not to use contraception in the future or 0 if another reason is main reason for intention not to use contraception in the future. The new category of fear of side effects is a combination of the three previous categories of 'fear of side effects', 'health concerns' and 'interferes with body's normal processes'. The distinction between these three categories is made at the time of interview by the interviewer who field codes the respondents answer into one of the available categories. Interviewers are given the following guidance to help with coding:

> 'SIDE EFFECTS are undesirable consequences of using a method that do not adversely affect the health of the user. For example, side effects may be spotting or bleeding with the pill, while HEALTH CONCERNS may be that she heard that the pill may be linked to breast cancer.' (ORC Macro, 2006:110)

It was felt that this rather subtle distinction may not be coded in a standardized way by different interviewers and so to avoid any introduction of bias the categories were combined together. The final response variable is as follows:

1- Fear of side effects is the main reason for intention not to use contraception in the future = 506 (38 %)
0 - Another reason is the main reason for intention not to use contraception in the future = 824 (62%)

5.3.2.2: Explanatory Variables

The primary explanatory variables in this study are measures of communication regarding family planning. All of these variables are coded as dichotomous with 0 corresponding to negative responses and 1 to affirmative responses. Three variables are included that measure exposure to family planning information via interpersonal channels. The coding of the variables used in the analysis is shown in full in appendix 5B. They are defined as follows:

- Discussed family planning with someone other than partner in the last few months

  As couples' characteristics are not included in this study a variable has been created representing whether or not a respondent has discussed family planning with someone other than a partner. The variable is based on the respondent's response to the following questions 'In the last few months, have you discussed the practice of family planning with your friends, neighbours or relatives? If the respondent answers 'yes', a follow up questions is asked 'with whom?' and then the respondent is prompted by 'anyone else?' (Ghana Statistical Service, 2004) The result is 10 variables in the data set coded 0 for 'no' and 1 for 'yes' for whether the respondent has discussed family planning with the following people: husband/partner, mother, father, sister, brother, daughter, son,

mother-in-law, friends or others. For this study these variables were combined together, excluding husband/partner, to create one dichotomous variable indicating either, yes, the respondent has discussed family planning with someone other than their husband in the last few months or no, they have not.

- Respondent has heard a family planning message at a community meeting in the few months prior to survey
- Respondent has received a family planning message from a health worker in the few months prior to survey

A further two variables are included as measures of exposure to mass media sources of family planning information:

- In the last few months respondent has heard messages about family planning on the radio
- In the last few months respondent has seen messages about family planning on the television

Background Variables Related to Family Planning

The following variables were included as measures of general attitude towards family planning as well as child bearing history and past experience with contraceptives:

- Children ever born. A discrete continuous variable with values ranging from 0 –12.
- Desire for more children. Categorical variable with three factor levels, wants, wants no more, undecided/other.
- Recent Sexual Activity. Categorical variable with three factor levels, 'active in last four weeks', 'not active in last four weeks' and 'never had intercourse'.
- Ever use of a contraceptive method. Binary variable coded 1 for 'yes' 0 for 'no'.

- Approval of family planning. Coded 0 if the respondent disapproves of family planning and 1 if the respondent approves of family planning.

Socio-economic/Demographic Control Variables

- Age. A discrete continuous variable with values ranging from 15 – 49 years.
- Education. Categorical variable with three factor levels, none, primary, secondary/higher.
- Ethnicity. Originally a categorical variable with nine factor levels this variable was collapsed into five factor levels: Akan, Mole-Dagbani, Ewe, Ga/Dangme and other (other combines Guan, Grussi, Gruma, Hausa and the original other categories). The grouping was decided based on the reported distribution of each ethnic group in the population by the GDHS. Akan accounts for 49% of the population with Mole-Dagbani second largest at 17% and Ewe and Ga/Dangme with 13% and 8% respectively. Therefore these four groups represent 87% of the total population and it was deemed reasonable to combine all other categories representing a total of 13% of the population.
- Occupation. Originally a categorical variable with nine factor levels this variable was collapsed into three factor levels. Not working, agricultural self-employed, and other employed. (Other employed combines the following original factor levels, professional/technical/managerial, clerical, sales, services, skilled manual, unskilled manual and 'don't know'. The original categories of 'agricultural-employee' and 'household domestic' were removed as they no longer contained any cases after the sub-sample was drawn.)
- Region. Categorical variable with factor levels 1-10.
- Religion. Originally a categorical variable with nine factor levels this variable was collapsed into five factor levels. No religion,

Roman Catholic, Protestant, Moslem and traditional/spiritualist/other. (Protestant combines the following categories: Anglican, Methodist, Presbyterian and other Protestant.)

- Type of place of residence. Dichotomous variable coded 1 for urban and 2 for rural.
- Wealth index. Categorical variable with five levels, poorest, poorer, middle, richer and richest. The wealth index is constructed by DHS based on all household assets and utility services. Principal component analysis is then used to apply weights to the indicator variables and the first of the factors produced is used as the wealth index. Quintiles are then constructed based on the frequency distribution of household population (Rutstein & Johnson, 2004).

5.3.2: Methods

5.3.2.1: Preliminary Data Analysis

All preliminary analysis including selecting the sub-sample and recoding variables as described previously was carried out using SPSS Version 16.0. The first stage in the preliminary analysis was to explore the bivariate associations of the explanatory variables with the response using two-way contingency tables. Most of the independent variables are categorical so two-way contingency tables show the conditional probability of Y given the factor levels of X for each independent variable. To describe the strength of any associations Pearson's Chi-squared tests of association were carried out on each pair of variables. The Pearson Chi-squared statistic is shown in 5.1.

$$\chi^2 = \sum \frac{\left(n_{ij} - \mu_{ij}\right)^2}{\mu_{ij}} \qquad (5.1)$$

H_o is statistical independence between variables and the test compares the actual fixed cell values (n_{ij}) with the expected frequencies (μ_{ij}), which are the expectation of values of n_{ij} when H_o is true. If H_o is true differences should be small, χ^2 takes a minimum value of zero when $n_{ij} = \mu_{ij}$ and the larger the difference the stronger the evidence against H_o.

5.3.2.2: Statistical Modelling

Fixed effects logistic regression was carried out using SPSS version 16.0. As described previously the response variable in this study is binary with two possible outcomes, fear of side effects as the main reason for not intending to use contraception in the future (success) or any other reason (failure). The probability of success is θ and the probability of failure is the compliment, *1-θ*, so: *Pr (Y = 1) = θ and Pr (Y=0) = 1-θ*. Multiple logistic regression is used with a logit link function to model the probability that *Y =1,* the logit function is specified as:

$$Logit(\theta) = Log\left(\frac{\theta}{1-\theta}\right) \qquad (5.2)$$

This link function allows the prediction of the log of the odds in favour of a success (numerator event), relative to a failure (denominator event) for observation i as a function of a vector of explanatory variables. The random component of the model is assumed to have a binomial distribution (Agresti & Findlay, 1997). The logistic regression model is specified as:

$$Logit(\theta) = \alpha + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_k X_k \qquad (5.3)$$

The regression coefficient β_1 represents the change in the log odds associated with being in a particular category of X_1 compared to the baseline category where $X_1 = 0$ while holding all of the other values constant. Where the explanatory variables are categorical, dummy variables are created in order to be able to distinguish between the factor

levels of each variable. The model then estimates a separate regression coefficient for each factor level except the baseline, to which the other levels are then compared. The exponential of β_1 the odds ratio of an individual in particular factor level citing fear of side effects as their main reason for intention not to use contraception compared to those in the baseline category. As the possible values of odds ratio are not symmetric, a negative association can only be represented by values between 0 and 1 but a positive value can be from 1 to ∞, the strength of association is the same when two values are the inverse of each other. Predicted probabilities can also be calculated, to estimate the effects of certain combinations of values of explanatory variables or of the interaction between two variables, while holding other variables in the model at the baseline, using the following equation:

$$\theta = \frac{\exp(a + \beta_1 x_1 + \beta_2 x_2 .... + \beta_k x_k)}{1 + \exp(a + \beta_1 x_1 + \beta_2 x_2 .... + \beta_k x_k)} \qquad (5.4)$$

For categorical variables the Wald test is used to determine the significance of individual parameters compared to the baseline category. The model selection for fixed effects was based on the principle of a nested hierarchy of models and used forward selection to comparing the deviance in the likelihood ratio test statistic between models. The likelihood ratio test uses the deviance in the L^2 statistic between the full and reduced models by testing that the extra parameters in the full model equal 0. The formula for the likelihood ratio statistic is:

$$-2\log\left(\frac{L_0}{L_1}\right) = (-2\log L_0) - (-2\log L_1) \qquad (5.5)$$

H_0 is that there is no difference between models and L_0 represents the model where H_0 is true with df equal to the number of extra parameters in L_1, a p-value less than 0.05 shows that the inclusion of an individual variable has significantly changed the model at the 5% level.

5.4: Results

5.4.1: Preliminary Data Analysis

5.4.1.1: Characteristics of Respondents

Table 5.4 shows respondent's characteristics in regard to the response and the interpersonal communication variables. This shows that overall 38% of respondents cite fear of side effects as their main reason for not intending to use a contraceptive method in the future. This figure differs from that quoted in the GDHS 2003 report due to the restricting of the sample and the merging of categories as outlined in section 5.3.1.

Table 5.4: Characteristics of Respondents in the Sub-sample - Response and Key Explanatory Variables

	Frequency	**Percent**
Response variable:		
Main reason for not intending to use a contraceptive method is fear of side effects	506	**38.0**
Main reason for not intending to use a contraceptive method is not fear of side effects	824	62.0
Interpersonal Communication Channels		
Discussed FP with others in the past few months		
Yes	242	**18.2**
No	1088	81.8
Heard a FP message at a community meeting in the past few months		
Yes	393	**29.5**
No	937	70.5
Heard a FP message from a health worker in the past few months		
Yes	539	**40.5**
No	791	59.5
Mass Media Communication Channels		
Heard a FP message on the radio in the last few months		
Yes	934	**70.2**
No	396	29.8
Seen an FP message on television in the last few months		
Yes	601	**45.2**
No	729	54.8

In terms of exposure to family planning information through interpersonal channels, 18% of respondents had discussed family planning with someone, other than their husband, in the last few months. This is less than the corresponding figure for the original sample of all women in which 26.5% had discussed family planning with someone. This is to be expected considering the sample for this study is contraceptive non-users not intending to use and it is intuitively reasonable that these respondents may be less likely to discuss family planning than current users of contraception or those intending to use in the future. Despite this table 5.4 shows that respondents in this sample appear well exposed to family planning information from other sources. 30% and 41% of respondents have heard a family planning message from a community meeting or health worker respectively. Regarding family planning information through mass media sources, messages have been heard on the radio by 70% of respondents making this by far the most frequently cited channel of mass media information, followed by television with 45% of respondents having heard a message.

Table 5.5: Characteristics of Respondents in the Sub-sample - Family Planning Related Variables

	Frequency	Percent
Family Planning Related Variables		
Desire for more children		
Wants	920	69.2
Does not want	313	23.5
Undecided/Other	97	7.3
Recent sexual activity		
Active in last 4 weeks	515	38.7
Not active in last 4 weeks	578	43.5
Never had intercourse	237	17.8
Ever use of a contraceptive method		
Never	920	69.2
Only traditional	94	7.1
Used modern	316	23.8
Respondent approves of family planning		
Approves	809	60.8
Disapproves	451	33.9
Don't know	70	5.3

* Other = never had sex and declared infecund

Table 5.5 shows the characteristics of the respondents with respect to the family planning related variables. The majority of respondents, 69%, want more children and 82% are sexually active with approximately half of those being active within the last 4 week prior to survey. Only 61% approve of family planning in general and only 24% have ever used a modern method. Number of children ever born is treated as a continuous variable and so is not shown in table 5.5. The mean number of children ever born is 2.66 with a standard deviation of 2.75. As would be expected the variable has a very strongly positively skewed distribution with 31.7% of respondents having no children and 24.2% having 5 or more.

Table 5.6: Characteristics of Respondents in the Sub-sample – Socioeconomic/Demographic Control Variables

Variable	**Percent (n)**	**Variable**	**Percent (n)**
Education level		**Region**	
No education	37.1 (494)	Ashanti	20.5 (273)
Primary	17.9 (238)	Greater Accra	14.4 (191)
Secondary	45.0 (598)	Brong Ahafo	11.6 (154)
Ethnicity		Northern	13.2 (176)
Akan	43.4 (577)	Western	6.3 (84)
Mole-Dagbani	19.7 (262)	Eastern	10.5 (140)
Ewe	10.6 (141)	Upper west	6.8 (91)
Ga/Dangme	8.7 (116)	Volta	6.6 (88)
Other	17.6 (234)	Upper east	2.9 (38)
Occupation		Central	7.1 (95)
Employed	44.1 (587)	**Religion**	
Agri-self employed	33.4 (444)	Protestant	56.1 (746)
Not working	22.5 (299)	Roman Catholic	12.5 (166)
Wealth Index		Moslem	21.7 (289)
Poorest	23 (306)	Traditional/spiritualist/other	3.5 (46)
Poorer	17.3 (230)	No religion	6.2 (83)
Middle	17.7 (235)	**Type of place of residence**	
Richer	19.8 (263)	Rural	57.5 (765)
Richest	22.3 (296)	Urban	42.5 (565)

Table 5.6 shows the distribution of respondents according to background variables. The majority of respondents, 63%, have some education with 71% of those having completed secondary school. Akan is the dominant ethnic group in the sample, as in the Ghanaian population as a whole, and

the majority of respondents are Protestant and live in rural areas. Overall 78% of respondents are working either in agriculture or other employment. The distribution of respondents by region follows that for the entire survey as published in the GDHS 2003 report with the largest concentration of population in Ashanti region and the smallest in the upper east region. The sub-sampling process has also preserved the distribution of respondents into wealth quintiles relatively well, with slightly more respondents in the poorest and wealthiest quintiles in this sample. Age is treated as a continuous variable and the mean age of the respondents is 29.89 years with a standard deviation of 10. This is also very similar to the whole sample which has a mean age of 29.25 with a standard deviation of 9.6.

5.4.1.2: Two-way Contingency Tables and Chi-Squared Tests for Association

The next stage in the preliminary analysis was to create two way contingency tables to show the conditional distribution of fear of side effects by all other variables. Chi-squared tests were carried out to determine if there is an association between each of the background explanatory variables and the response variable. Table 5.7 shows the percentage distribution of those who cite either, fear of side effects or another reason as their main reason for not intending to use a contraceptive in the future, by exposure to family planning communication.

Table 5.7: Main Reason for not intending to use Contraception in the Future by exposure to FP information

Variable	Respondent cites 'fear of side effects' as main reason for not intending to use contraception in the future % (n)	Respondent cites other reason as main reason for not intending to use contraception in the future % (n)
Interpersonal Communication Channels		
Discussed FP with others in the past few months		
Yes	48.8 (118)	51.2 (124)
No	35.7 (388)	64.3 (700)
Heard a family planning message at a community meeting in the past few months		
Yes	46.8 (184)	53.2 (209)
No	34.4 (322)	65.6 (615)
Heard a FP message from a health worker in the past few months		
Yes	45.3 (244)	54.7 (295)
No	33.1 (262)	66.9 (529)
Mass media Communication Channels		
Heard a FP message on the radio in the last few months		
Yes	42.6 (398)	57.4 (536)
No	27.3 (108)	72.7 (288)
Seen a FP message on television in the last few months		
Yes	45.6 (274)	54.4 (327)
No	31.8 (232)	68.2 (497)

Table 5.7 shows that in all cases the percentage of respondents who cite fear of side effects as their reason for not intending to use a method in the future is higher among those who have been exposed to a family planning message compared to among those who have not. Almost 50% of those who have discussed family planning with someone other than their husband cite fear of side effects as their reason for not intending to use a method in the future. This suggests that there is evidence in this data to support the hypothesis that interpersonal communication may increase the fear of side effects (by spreading myths and misinformation). The alternate hypothesis that mass media information reduces fear of side effects is not supported by this data. To formally test for association between the variables chi-squared tests for independence were carried out, the results are presented in table 5.8.

Table 5.8: Results of Chi-squared Tests for Independence – Response Variable by Communications Variables

Variable	Pearson Chi-Square Value	df	Asymp. Sig. (2-sided)
Discussed FP with others in the past few months	14.410	1	.000
Heard a FP message at a community meeting in the past few months	18.220	1	.000
Heard a FP message from a health worker in the past few months	20.065	1	.000
Heard a FP message on the radio in the last few months	27.762	1	.000
Seen a FP message on television in the last few months	26.485	1	.000

Table 5.8 shows that in all cases the p-values of the chi-squared tests are below 0.01 so at the 1% significance level there is an association between hearing a family planning message through any of these five communication channels and citing fear of side effects as the main reason for not intending to use a method in the future.

Table 5.9 shows the conditional distribution of fear of side effects by family planning related variables. The table shows that those who are more likely to cite fear of side effects as the main reason for not intending to use a method in the future do not want more children, are sexually active, and approve of family planning in general. There is clear evidence of a negative effect of past contraceptive use, with 34 % of those who have never used a method citing fear of side effects as the main reason for not intending to use a method in the future compared to 43% who have ever used a traditional method and 48% who have ever used a modern method. Not shown in table 5.9 is the difference in number of children ever born among those in the different response categories. The mean number of children ever born is slightly higher among those who cite fear of side effects as the main reason for not intending to use a method in the future at 2.73 compared to those who cite other reasons who have on average 2.62 children.

Table 5.9: Main Reason for not intending to use Contraception in the Future by Family Planning Related Variables

Variable	Respondent cites 'fear of side effects' as main reason for not intending to use contraception in the future % (n)	Respondent cites other reason as main reason for not intending to use contraception in the future % (n)
Desire for more children		
Wants	37.8 (348)	62.2 (572)
Does not want	45.0 (141)	55.0 (172)
Undecided	17.5 (17)	82.5 (80)
Recent sexual activity		
Active in last 4 weeks	44.7 (230)	55.3 (285)
Not active in last 4 weeks	34.1 (197)	65.9 (381)
Never had intercourse	33.3 (79)	66.7 (158)
Ever use of a contraceptive method		
Never	34.0 (313)	66.0 (607)
Only traditional	42.6 (40)	57.4 (54)
Used modern	48.4 (153)	51.6 (163)
Respondent approves of family planning		
Approves	39.6 (171)	60.4 (489)
Disapproves	37.9 (320)	62.1 (280)
Don't know	21.4 (15)	78.6 (55)

All of the categorical variables are significantly associated at the 5% level with citing fear of side effects as the main reason for not intending to use a method in the future according to the results of the chi-squared tests for associations which are shown in table 5.10.

Table 5.10: Results of Chi-squared Tests for Independence – Response Variable by Family Planning Related Variables

Variable	Pearson Chi-Square Value	df	Asymp. Sig. (2-sided)
Desire for more children	23.858	2	.000
Recent sexual activity	15.643	2	.000
Ever use of a contraceptive method	21.553	2	.000
Respondent approves of family planning	8.986	2	.011

Table 5.11 shows fear of side effects by socio-economic and demographic background variables. The results show that the percentage of respondents citing fear of side effects as the main reason for not intending to use a method in the future increases as both education level and wealth index increase. Those respondents who are Ga/Dangme, living in urban areas, are Protestant and employed are more likely than others to cite fear of side effects as the main reason for not intending to use a method in the future. The mean age of respondents who cite reasons other than side effects as their main reason for intending not to use a contraceptive method in the future is 30 years, compared to a slightly younger 29.71 for those who do have a fear of side effects. Table 5.11 shows a significant regional effect with those regions in the south of the country having a higher percentage of respondents citing fear of side effects as the main reason for not intending to use a method in the future compared to those in the north. In particular the Ashanti, Central and Volta regions have high percentages of women with fear of side effects.

Table 5.11: Main Reason for not Intending to use Contraception in the Future by Socio-economic/Demographic Variables

Variable	Respondent cites 'fear of side effects' as main reason for not intending to use contraception in the future % (n)	Respondent cites other reason as main reason for not intending to use contraception in the future % (n)
Education level		
No education	27.5 (136)	72.5 (358)
Primary	42.9 (102)	57.1 (136)
Secondary/higher	44.8 (268)	55.2 (330)
Ethnicity		
Akan	45.6 (263)	54.4 (314)
Mole-Dagbani	23.3 (61)	76.7 (201)
Ewe	40.4 (57)	59.6 (84)
Ga/Dangme	48.3 (56)	51.7 (60)
Other	29.5 (69)	70.5 (165)
Occupation		
Employed	45.1 (265)	54.9 (322)
Agricultural self- employed	33.6 (149)	66.4 (295)
Not working	30.8 (92)	69.2 (207)
Wealth Index		
Poorest	24.5 (75)	75.5 (231)
Poorer	34.3 (79)	65.7 (151)
Middle	43.0 (101)	57.0 (134)
Richer	43.7 (115)	56.3 (148)
Richest	45.9 (136)	54.1 (160)
Region		
Ashanti	57.1 (156)	42.9 (117)
Greater Accra	40.3 (77)	59.7 (114)
Brong Ahafo	23.4 (36)	76.6 (118)
Northern	17.6 (31)	82.4 (145)
Western	42.9 (36)	57.1 (48)
Eastern	43.6 (61)	56.4 (79)
Upper west	24.2 (22)	75.8 (69)
Volta	45.5 (40)	54.5 (48)
Upper east	10.5 (4)	89.5 (34)
Central	45.3 (43)	54.7 (52)
Religion		
Protestant	44.6 (333)	55.4 (413)
Roman Catholic	38.6 (64)	61.4 (102)
Moslem	27.0 (78)	73.0 (211)
Traditional/spiritualist/other	17.4 (8)	82.6 (38)
No religion	27.7 (23)	72.3 (60)
Type of place of residence		
Rural	34.5 (323)	65.5 (501)
Urban	42.8 (242)	57.2 (264)

Figure 5.4 shows a map of Ghana representing this result and shows clearly that the regions in the south have a higher percentage of respondents citing fear of side effects as the main reason for not intending to use a method in the future.

Figure 5.4: Map Showing Percent of Respondents who Cite Fear of Side Effects as their Main Reason for not Intending to use a Contraceptive Method in the Future by Region

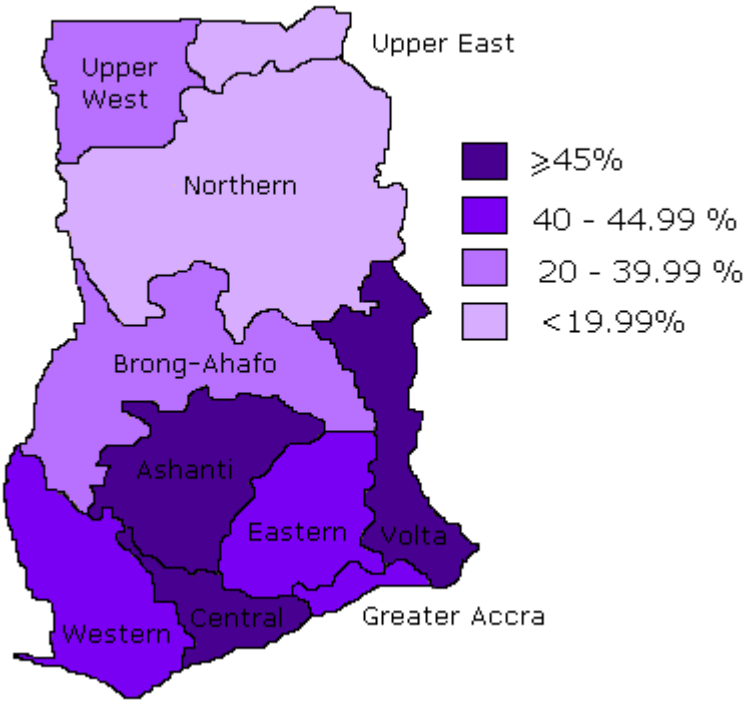


Table 5.12 shows the results of the chi-squared tests for association between the response and the socio-economic explanatory variables. The table shows that all of these variables have a significant association at the 1% level with reason for not intending to use a method in the future.

Table 5.12: Results of Chi-squared Tests for Independence – Response Variable by Background Variables

Variable	Pearson Chi-Square Value	df	Asymp. Sig. (2-sided)
Education level	37.141	2	.000
Ethnicity	50.886	4	.000
Occupation	23.060	2	.000
Religion	40.847	4	.000
Region	114.311	9	.000
Type of place of residence	9.549	1	.002
Wealth index	38.985	4	.000

5.4.2: Binary Logistic Regression Results

The logistic regression models were selected using forward selection based on the likelihood ratio test as described in section 5.3.2.2. The model selection process was carried out in three stages. First the family planning communication variables were considered and a model containing the significant communication variables was selected. Next, the family planning related variables were added to this model and those that significantly improved the fit of the model were retained. Finally the same process was repeated this time including all of the socio-economic and demographic background variables. Once a final model was fitted interaction between variables were tested to see if they improved the fit of the model but no interaction were included in the final model. Table 5.13 shows the estimated coefficients for model one which contains only the significant family planning communication variables.

Table 5.13: Logistic Regression Coefficients for Model 1 with Main Reason for Not Intending to Use a Method in the Future as the Response Variable and Family Planning Communication Variables

Variable	β	SE (β)	p	exp (β)
Heard a family planning message from health worker in the last few months				
No (RC)	0			1.00
Yes	.353	.120	.003	1.423
Heard a family planning message on the radio in the last few months				
No (RC)	0			1.00
Yes	.417	.149	.005	1.517
Seen a family planning message on the television in the last few months				
No (RC)	0			1.00
Yes	.337	.130	.009	1.401
Constant	-1.095	.117	.000	.335

Not shown in table 5.13 are the variables which were not significant predictors of intention not to use a contraceptive method in the future. This includes hearing a family planning message at a community meeting and discussing family planning with someone other than the husband. Table 5.13 shows that for each of the three remaining family planning communication variables the odds of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future increase by between 40% and 52% for those who have been exposed to messages compared to those who have not.

Table 5.14 shows the model coefficients for model two, to which the family planning related variables have been added.

Table 5.14: Logistic Regression Coefficients for Model 2 with Main Reason for Not Intending to Use a Method in the Future as the Response Variable, Family Planning Communication Variables and Family Planning Related Variables

Variable	β	SE (β)	p	exp (β)
Heard a family planning message from health worker in the last few months				
No (RC)	0			1.00
Yes	.340	.125	.006	1.405
Heard a family planning message on the radio in the last few months				
No (RC)	0			1.00
Yes	.384	.153	.012	1.468
Seen a family planning message on the television in the last few months				
No (RC)	0			1.00
Yes	.310	.138	.024	1.363
Desire for more children				
Wants (RC)	0			1.00
Does not want	.159	.141	.260	1.173
Undecided/Other	-1.242	.284	.000	.289
Recent sexual activity				
Active in last 4 weeks (RC)	0			1.00
Not active in last 4 weeks	.251	.184	.173	1.285
Never had intercourse	-.177	.181	.329	.838
Ever use of a contraceptive method				
Never (RC)	0			1.00
Only traditional	.283	.235	.227	1.328
Used modern	.396	.147	.007	1.485
Constant	-1.159	.175	.000	.314

Table 5.14 shows that the effect of the family planning communication variables is moderated slightly by the inclusion of the family planning related variables but all three remain significant. Number of children ever born and general approval of family planning are not included in the model as their inclusion did not improve the overall fit of the model. Recent sexual activity is included in the model on the basis of the likelihood ratio test; however the Wald tests shows that neither of the categories is significantly different to the baseline category. Those respondents who are undecided about wanting more children have

significantly lower odds of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future than those who want more children. Table 5.14 also shows that respondents who have used a modern method in the past are 48% more likely to cite fear of side effects as the main reason for intention not to use a contraceptive method in the future than those who have never used. This figure is 33% for those who have used traditional methods only in the past but this is not significantly different from those who have never used a method.

Table 5.15 shows the final model with all of the explanatory variables added. The Hosmer and Lemeshow Test shows this model to be an acceptable fit to the data with a chi-squared value of 15.29 on 8df and a p-value of 0.54. The Nagelkerke R Square is .204 suggesting that there is still a significant amount of variance in this data unexplained by the model. A plot of the change in deviance against the predicted probabilities of this model shows that the model fits reasonably well for cases where fear of side effects is not the reason for intention not to use in the future but those who do cite fear of side effects as main reason for intention not to use a method in the future but have small predicted probabilities are poorly represented in the model. The plot is included in appendix 5C.

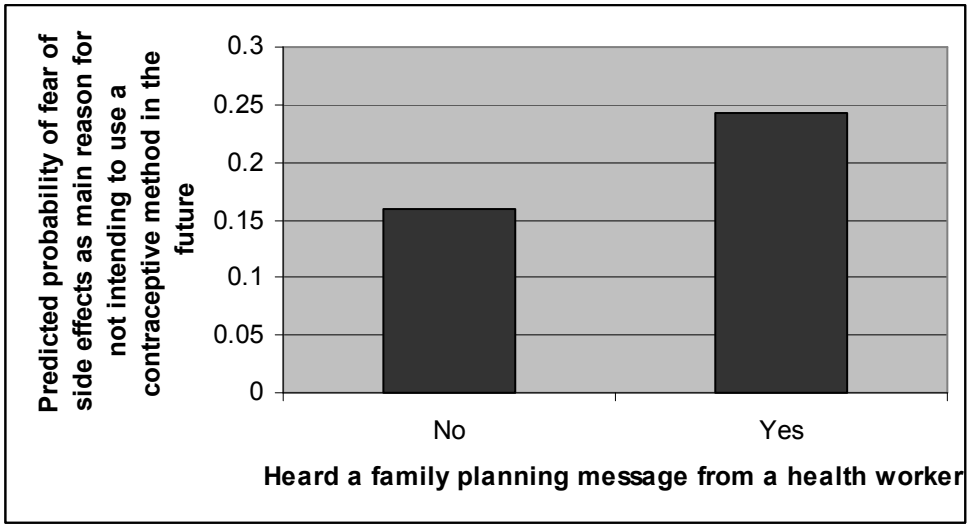
In this model being exposed to a family planning message from radio or television is no longer a significant predictor of main reason for intention not to use a contraceptive method in the future. The only communication variable remaining is receiving a message from a health worker which increases the odds of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future by 68%. For the purposes of model interpretation predicted probabilities have been predicted for the probability of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future according to selected characteristics while holding all other variables at their baseline values.

Table 5.15: Logistic Regression Coefficients for Model 3 with Main Reason for Not Intending to Use a Method in the Future as the Response Variable, Family Planning Communication Variables, Family Planning Related Variables and Background Variables

Variable	β	SE (β)	p	exp (β)
Heard a family planning message from health worker in the last few months				
No (RC)	0			1.00
Yes	.521	.136	.000	1.684
Heard a family planning message on the radio in the last few months				
No (RC)	0			1.00
Yes	.033	.158	.835	1.033
Seen a family planning message on the television in the last few months				
No (RC)	0			1.00
Yes	.282	.167	.091	1.326
Desire for more children				
Wants (RC)	0			1.00
Does not want	.411	.176	.020	1.509
Undecided/Other	-1.083	.297	.000	.338
Recent sexual activity				
Never had intercourse (RC)	0			1.00
Active in last 4 weeks	.622	.233	.008	1.863
Not active in last 4 weeks	.122	.220	.581	1.129
Ever use of a contraceptive method				
Never (RC)	0			1.00
Only traditional	.171	.251	.496	1.187
Used modern	.382	.158	.016	1.465
Age	-.043	.010	.000	.958
Occupation				
Not working (RC)	0			1.00
Agricultural-self employed	.535	.218	.014	1.708
Employed	.615	.191	.001	1.850
Region				
Western (RC)	0			1.00
Central	.002	.317	.995	1.002
Greater Accra	-.099	.283	.726	.906
Volta	.137	.326	.674	1.147
Eastern	-.064	.293	.828	.938
Ashanti	.675	.267	.011	1.964
Brong Ahafo	-.941	.303	.002	.390
Northern	-1.083	.313	.001	.339
Upper west	-.733	.347	.034	.480
Upper east	-1.655	.585	.005	.191
Constant	-.370	.317	.243	.691

Figure 5.5 shows the predicted probabilities of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future according to whether or not the respondent has heard a family planning message from a health worker, with age at the mean (30 years) and all other variables at the baseline values. The figure shows that there is a significantly higher probability of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future if a respondent has heard a message from a health worker.

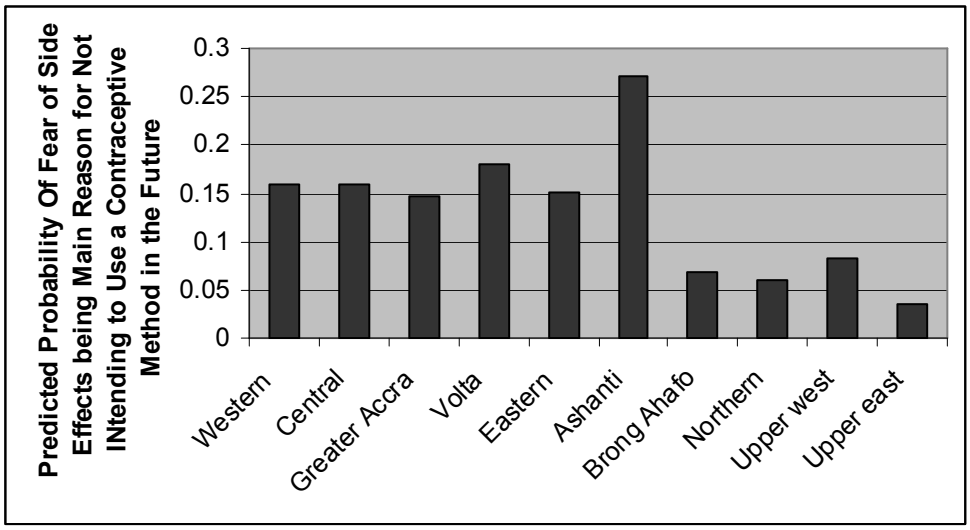
Figure 5.5: Predicted Probabilities of Fear of Side Effects as Main Reason for not Intending to Use a Contraceptive Method in the Future by Hearing a Family Planning Message from a Health Worker[14]



[14] When calculating the predicted probabilities age is set to the mean value, 30 years, and all other variables are held at their baseline values.

Figure 5.6 shows the predicted probabilities of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future according to region, with age at the mean (30 years) and all other variables at the baseline values. The figure shows that generally there is a significantly lower probability of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future, in regions in the north of Ghana compared to regions in the south. The Ashanti region stands out as having an extremely high probability of respondents citing fear of side effects as the main reason for intention not to use a contraceptive method in the future at over 0.25, suggesting a particular issue with fear of side effects in this region.

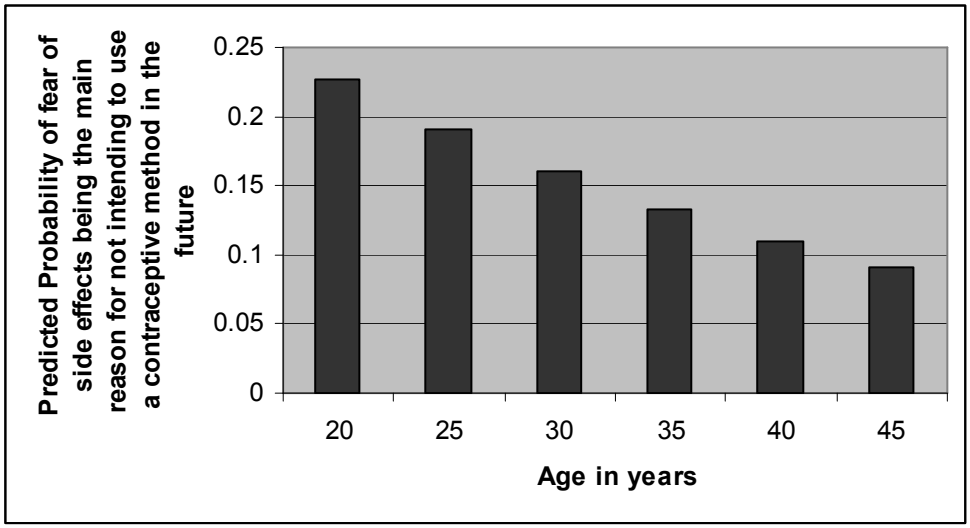
Figure 5.6: Predicted Probabilities of Fear of Side Effects as Main Reason for not Intending to Use a Contraceptive Method in the Future by Region[15]



[15] When calculating the predicted probabilities age is set to the mean value, 30 years, and all other variables are held at their baseline values.

Figure 5.7 shows the predicted probabilities of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future by age, with all other variables at the baseline values. The figure shows a clear pattern that there is a significantly lower probability of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future, as age increases.

Figure 5.7: Predicted Probability of Fear of Side Effects as Main Reason for not Intending to Use a Contraceptive Method in the Future by Age[16]



[16] When calculating the predicted probabilities age is varied while all other variables are held at their baseline values.

Table 5.16 shows the predicted probabilities for the remaining variables in the model with age at the mean value and all other variables at baseline.

Table 5.16: Predicted Probabilities of Fear of Side Effects as Main Reason for not Intending to Use a Contraceptive Method in the Future by Explanatory Variables[17]

Variable	Predicted Probability
Desire for more children	
Wants	0.16
Does not want	0.22
Undecided/Other	0.06
Recent sexual activity	
Never had intercourse	0.16
Active in last 4 weeks	0.26
Not active in last 4 weeks	0.18
Ever use of a contraceptive method	
Never	0.16
Only traditional	0.18
Used modern	0.22
Occupation	
Not working	0.16
Agricultural-self employed	0.25
Employed	0.26

Table 5.16 shows that the predicted probabilities of citing fear of side effects as the main reason for intention not to use a contraceptive method in the future are highest for those who do not want other children, who are currently sexually active, are employed and have used a modern method in the past.

[17] When calculating the predicted probabilities age is set to the mean value, 30 years, and all other variables are held at their baseline values.

5.5: Discussion and Conclusions

5.5.1 Discussion

The results show that exposure to family planning messages in the mass media does not have any significant effect on the likelihood of fear of side effects being the main reason for not intending to use a method in the future. This is contrary to what might be expected given the framework of the study but is not in contradiction with any previous studies. In addition to this the results of the focus group study presented in chapter three of this thesis also found that mass media communication was not mentioned as an important source of information on contraceptive use. The focus group participants identified interpersonal sources of information, in particular information from health workers, as being influential to their knowledge of side effects. In concurrence with this finding the only family planning communication variable in this study which does have a significant effect is receiving a message from a health worker which increases the odds of fear of side effects being the main reason for not intending to use a method in the future. Again this is contrary to what might be expected but there are a number of possible explanations for this.

Firstly, this result raises a question over the content of the information being given by health workers. The framework for this study assumes that information from health workers is positive and encourages contraceptive use in all cases but that may not necessarily be accurate in instances where a provider has a particular bias against certain sub-groups, such as adolescents or the unmarried, or against providing certain methods.

Secondly, there is an intuitive link between provider communication and fear of side effects in the sense that in order to have 'fear of side effects' an individual must have some knowledge of side effects. Some of this knowledge may come from past experience, some from others in the

social network and some from service providers. While some of the information gathered by an individual may be based on negative stories or misinformation it is also reasonable that basic factual information about the potential side effects of methods gathered from a health worker may contribute to fear of side effects. Thought about in these terms it seems natural that there would be an association between increased likelihood of fear of side effects and information from a health worker. Additionally those individuals whose fear of side effects is decreased by the information received from a health worker have likely gone on to either use a method, or say they do intend to use a method in the future, in which case they are not longer in the sample for this study.

A result of this study which was expected, given the existing literature, is that the past use of modern methods increases the likelihood of fear of side effects being the main reason for not intending to use a method in the future. This is in agreement with results found by Sedgh et al. (2007: 37) who suggest that this reflects poor quality services and these women have not 'obtained services of sufficient quality to help them cope with the specifics of contraceptive use.' This may also be related to the source of contraceptive supplies and rather than indicating low quality care it may indicate a lack of counseling altogether when contraceptives are obtained from a commercial source. This is also an issue raised by the women in the focus group study who raised the idea that when side effects are experienced it is often the case that individuals have not seen a health professional when they obtained their method.

Although this result suggests that a great number of past users of modern methods have had problematic experiences with their method this is not actually the case. The majority of past users who have not experienced any problems will either be continuing to use currently or intending to use again in the future and hence will not be in this sub-sample at all. Therefore, while past negative experiences are undoubtedly sometimes the cause of current fear of side effects and intentions not to use a method again in the future, the magnitude of the problem on the whole is

overemphasized by the design of this analysis. Additionally the results show a strong regional effect with fear of side effects as main reason for not intending to use being most prevalent in the south. This may reflect regional differences in the family planning supply environment and quality of care. This result could also show evidence of a diffusion effect in the spread of negative information about potential side effects and highlights that particular attention needs to be paid to this issue in southern Ghana and in the Ashanti region especially.

Contrary to the study by Nair and Smith (1984) urban and rural residence, level of education and number of living children were not found to be significant predictors of reason for not intending to use contraception in the future. However the patterns seen in the socio-economic and family planning related variable which are significant in this study do suggest an interesting interpretation. The results show that the probability of citing fear of side effects as the main reason for not intending to use a method of contraception in the future is lowest for those individuals who are not employed, undecided about or wanting children in the future, not currently sexually active and older. In addition, they are likely to be the least well informed on family planning through the mass media or interpersonal communication channels and are the least likely to have second hand experience of the outcomes of contraceptive use by virtue of living in the regions of the country where the contraceptive prevalence is the lowest. Taken as a whole this profile is the exact opposite of the profile we would expect to fit a current user of a modern contraceptive method. Therefore where the probability of citing fear of side effects as the main reason for not intending to use contraception in the future is high, the profile of those individuals is on average most similar to the profile of current users of modern methods.

This suggests that fear of side effects is the last in a series of barriers to the adoption of a modern method and occurs most often when individuals are at the end of the decision making process and have already overcome other, perhaps more substantial, barriers such as lack of knowledge or

lack of access. These individuals are sufficiently motivated to avoid or delay pregnancy that they have engaged in the decision making processes and either directly sought or indirectly gained knowledge of modern contraceptive methods. Along with this they have also gained knowledge of the potential for negative side effects resulting from the use of modern methods and their motivation to use is not yet quite sufficient for them to overcome this final barrier. This could imply that those individuals who are most likely to cite fear of side effects as their main reason for not intending to use a contraceptive method in the future could be the most open to changing their intentions and their future contraceptive behaviour with increased counselling and encouragement on managing or tolerating potential side effects.

The previous interpretation of the results of this study would contradict Cleland's (2001) ideas that fear of side effects is simply an acceptable way of expressing general disapproval of family planning. This interpretation of the results would also be at odds with the conclusions of Nair and Smith (1984) regarding the lack of engagement in a rational decision making process by individuals with fear of side effects; although this study does find similar results to theirs, in the sense that a high level of variation in the outcome variable remains unexplained by this model. The variables included as predictors in this analysis are done so on the basis of their relevance in previous studies to contraceptive non-users. However perhaps given the results of this study, those who do not intend to use in the future due to fear of side effects should be treated as having a socio-economic profile more comparable to current users than current non-users and further study is needed to determine which characteristics are most pertinent to predicting reasons for not intending to use a method.

5.5.2 Conclusion

In conclusion this study presents results which show that individuals who cite fear of side effects as their main reason for not intending to use

contraception in the future are more likely to be employed, live in the south of Ghana, be older on average, not want any more children but be currently sexually active (and hence at risk of unwanted pregnancy) and have heard family planning information from a health worker. This profile suggests that these individuals may be more similar to current users than to those who do not intended to use contraception in the future for other reasons. One way of interpreting these results is that this group are more likely than any other, with the right encouragement and information, to change their future intentions and should therefore be targeted by service providers and IEC activities. Looking back at the conceptual framework for this study, presented in figure 3.1, it may be possible with the correct inputs through the communication channels to make the relationship between contraceptive use and fear of side effects a two way flow; meaning that those who have the intention not to use a contraceptive in the future due to fear of side effects can change their intentions and become contraceptive users. Additionally those who are past users but do not intend to use in the future due to fear of side effects, possibly related to past personal experience, can also become users again with access to proper counselling and a range of different methods.

The association between hearing a family planning message from a health worker and being more likely to be afraid of side effects may represent intentional information gathering behaviour on the part of the individual, which indicates that they have at least some level of interest in family planning and some potential motivation to avoid pregnancy. They have found out enough detailed information, from health workers and presumably other sources, in order to develop a fear of the potential side effects, but with a more positive information and encouragement may be able to overcome this fear and change their future intentions for contraceptive use .

Chapter Six

Summary and Conclusion

This final chapter of the thesis will summarize the results of all three papers and bring together the findings to make some overall conclusions. The original aims as set out in the introduction will be addressed and the use of different data and methodologies will also be commented on and the success of the strategy evaluated. This chapter will also include sections on policy recommendations and suggestions for further study.

6.1: Summary of Results

Paper one:

- Contraceptive side effects are a frequent topic of discussion but most of the information being discussed is based on real events and expected side effects. As such this type of information passed around the informal social network cannot be dismissed as rumour or myth.
- Communication from health workers is seen to be the most influential source of information. Second to this is information from women who are known to be current users; however many women are reluctant to disclose their status as users because they may face pressure to stop using if they become ill for any reason other than their contraceptive use.
- In most cases women were able to give rational explanations for the more extreme stories of side effects they hear. For example, it is often thought that side effects result from user error or that the symptoms being attributed to side effects are actually caused by a coincidental illness or disease. Fear of side effects persists despite these rationalizations however where the motivation to avoid pregnancy is high potential users can overcome their fears, through proper counselling.

Paper two:

- The most frequently reported side effect is menstrual changes which account for ¼ of all the months of side effects reported. Injectables and the pill are most often associated with experiencing side effects and they each attract around the same frequency of side effects once the length of episodes is taken into account.
- Experiencing side effects is shown to be a significant predicator of discontinuation and in all cases the probability of discontinuation is higher where side effects are experienced. The relationship between side effects and discontinuation varies over time and the probability of discontinuing when a side effect is experienced, relative to when it is not, increases as the duration of the episode increases.
- The only family planning communication variable which significantly predicts discontinuation is being encouraged by a health worker at some point during the episode. The probability of discontinuing is 10% less if encouragement from a health worker is received in episodes 0-6 months long compared to if it is not. The strength of the effect of encouragement by a health worker also varies over time and the difference in probability of discontinuation amongst those who have been encouraged and those who have not decreases as the duration of the episode increases.

Paper three:

- The only family planning communication variable which has a significant effect on predicting reason for not intending to use a method in the future is communication from a health worker.
- Those who have heard a family planning message from a health worker in the few months prior to the survey are more likely to cite fear of side effects as their reason for intention not to use in the future than those who have not.

- The socio-economic profile of those who cite fear of side effects as their main reason for not intending to use in the future is more similar to current users than those who intend not to use for other reasons. Those citing fear of side effects as their main reason for not intending to use in the future are on average employed, living in the south of Ghana, sexually active but not wanting more children and are past users of modern methods.

6.2: Conclusion

The two main questions which this thesis sought to answer were:

- In what way does fear of side effects influence contraceptive behaviour and function as a barrier to the use of modern or hormonal methods among women in Ghana?
- Is the fear of side effects and subsequent contraceptive behaviour influenced by exposure to different sources of family planning information?

The results of the three studies show that in each case fear of side effects, or the actual experience of side effects does significantly influence contraceptive behaviour. Fear of side effects act as a barrier by preventing the adoption of a contraceptive method and influencing future intentions regarding contraceptive use, while the experience of side effects increases discontinuation of methods and so interrupts the continuity of use. Both of these scenarios influence the overall contraceptive prevalence by reducing the number of current users in the population at any given time.

The fear of side effects seems to be exaggerated compared to the actual experience of side effects, which while undoubtedly causing discomfort and health problems for some are not a problem for the majority of users. This is due to negative information circulating through the informal social network and providing women with many negative examples on which to base their opinions. Generally speaking, a new user who takes a

method, has no side effects and is happy with the method is not a topic of conversation. Therefore negative information, which is based on one or two cases, is amplified as by being retold multiple times within the social network. The fact that this information usually originates from the actual experience of a contraceptive user means the information circulating cannot be dismissed at myth or rumour.

Those negative experiences being discussed do not necessarily reflect the experience of a typical user but rather cases of incorrect use or of other illnesses being blamed on method use. The misuse of methods is a problem when inadequate counselling and instructions are given or in the case of the pill when a service provider is not consulted at all but rather the pills are brought from a drug store or pharmacy. The availability of the pill without prescription may increase its use by those who find this the most convenient point of access, but a consequence of this may be an increase in fear of side effects due to occasional extreme effects being discussed within the informal network.

Past experience of using a modern method is also a contributing factor to fear of side effects and intention not to use a method. This may reflect poor quality of care and a lack of follow up care at the time of the previous episode of use. This is problematic because it does not only result in the discontinuation at that time but it has lasting effects on those individuals' intentions for their future contraceptive behaviour. Not only is this, but the negative effect is also passed on, via discussions of the experience within the social network, to influence the contraceptive behaviour of more than original user.

Positive information is most likely to be conveyed by current users who are potentially very influential in overcoming fear of side effects. Current users are considered by others to be a reliable source of information and they should be encouraged to participate in education campaigns. The results from all three papers also highlight the importance of family planning communication from health workers and counselling on what to

expect and how to cope with side effects. Other sources of information on family planning or sources or encouragement or discouragement do not have any significant effects on contraceptive behaviours in this study. Encouragement from a health worker during an episode of use decreases the probability of discontinuation of the episode, however hearing a family planning message from a health worker increases the probability that someone not intending to use a method in the future will cite fear of side effects as the main reason.

The association between the probability of intention not to use in the future due to fear of side effects and hearing information from a health worker may be reflecting information seeking behaviour on the part of the individual. In order to develop fear of side effects individuals have been exposed to a certain amount of information which has made them aware of the potential problems methods can have. The fact that these women have engaged in information seeking behaviour and an active decision making process means that serious barriers to use, such as lack of knowledge or disapproval, have already been overcome. Although they do not intend to use in the future at the time of the survey, with sufficient motivation to avoid pregnancy and some encouragement they may be able to also overcome the barrier of fear of side effects.

Some women are still ambivalent about their fertility intentions and their desired family size, for example in transitional populations where desired family size is decreasing but there are still many people in the community with large families. Ghana is characteristic of this kind of population where the CPR is relatively high and the TFR relatively low in comparison to other countries with a similar level of socio-economic development. This is especially true in southern Ghana where the level of social development is higher than in the north. Desired family size is changing individual's fertility intentions but small families are not yet a fully established social norm. Where women are ambivalent about their fertility intentions fear of side effects can be enough of a deterrent for preventing them from adopting a method. However, once they have

become highly motivated to limit or space their births fear of side effects is not longer sufficient to stop them from adopting a modern method.

It seems from the above conclusions that there may be a tipping point between motivation and lack of understanding. With some motivation to avoid pregnancy women will seek information and improve their understanding of contraceptive use. When they are then exposed to negative information and the possibility of side effects their motivation may not be strong enough to proceed to the final step of adopting a method. However this study shows that with sufficient motivation to avoid pregnancy and adequate counseling the fear of side effects can be overcome and the actual experience of side effects can be tolerated.

The three different types of data have each contributed a new perspective on this issue and have come together successfully to provide both depth and breadth of knowledge on this issue. Rather than being combined within one study the different methodologies are able to stand alone and their individual strengths can be fully exploited. The combination of methods, each with their own strengths and weaknesses, compliment each other as one method compensates for the weaknesses of another.

6.3: Policy recommendations

- Current users should be encouraged to act as peer educators and share their positive experiences with potential users within their communities. Current users can be involved in IEC activities or other forms of peer to peer counselling. This should be done with care to protect each individual from any social consequences of disclosing their contraceptive status. Increased education to improve the general acceptability in the community of modern method use will facilitate the use of peer educator and encourage women to adopt this role.
- Counselling from health workers is extremely important in minimizing discontinuation rates and so effort should be expended

in insuring service providers are well trained and are providing appropriate and adequate counselling. Additionally how side effects are dealt with when they do occur should be examined to avoid negative experiences. Side effects should not be dismissed or minimized, in particular menstrual changes which are often experienced.

- Information acquired through informal communication should not be dismissed by health workers but rather some way must be found to communicate the relative uncommonness of these events and that there is not necessarily any link between one persons experience and another.
- In addition a very important but neglected and unregulated source of contraceptives is pharmacies. Widespread availability of methods undoubtedly increases the CPR; however an unintended effect of this is an increase in fear of side effects due to a lack of adequate counseling. More attention to the training of pharmacists to provide counseling on side effects may help to decrease misuse and hence the negative flow of information.
- Currently particular attention needs to be paid to this issue in southern Ghana and in the Ashanti region especially. However fear of side effects may increase as the CPR increases and women are exposed to more information and more examples of the potential negatives of using a modern method. This means that in other regions of Ghana as the CPR rises in the future so may the fear of side effects rise and service providers should be aware of this potential.
- Those who do not intend to use a method in the future because of fear of side effects are more alike current users than those not intending to use for other reasons. Therefore they may be more likely than any other with the right encouragement and information, to change their future intentions and should therefore be targeted by service providers and IEC activities.
- The models show that each individual may have an inherent capacity to tolerate side effects or not. As such service providers

should as far as possible treat each case as individual and have the flexibility to respond to the changing needs of users as they progress through each episode of use.

6.4: Suggestions for Further Study

An obvious extension to this study would be to study the role of men in the creation of fear of side effects. Husband's characteristics could be included in models of female's contraceptive behaviour or models specified based solely on men's data where the husband reports on his wife's contraceptive use. Qualitative research on this topic involving men would also be illuminating as their level of knowledge regarding these issues is unknown within the literature.

This study concluded that it is not possible to predict fear of side effects based on socio-economic characteristics and it would be interesting to see if this is also true for the actual experience of side effects. It would also be informative to model the occurrence of side effects as the outcome variable to determine if there is anything discernable about the individual which makes them more susceptible to side effects, or more likely to report symptoms as side effects.

One of the real strengths of this study has been the availability of a longitudinal data from Ghana set appropriate for this study. Longitudinal studies in sub-Saharan African settings are rare due to the expense and difficultly involved with their collection. The Cape Coast data is very rich and complex and there is the potential for more studies which could be done. The results of this study show that there is significant women level variation in propensity to discontinue so looking at the factors causing that variation may help programmes to better target their limited resources. Event history analysis techniques such as multi-state models could be used to include multiple transitions and periods of non-use. In this way the individual could become the unit of analysis rather than the episode and each individual's propensity to experience side effects and to

discontinue could be examined across multiple episodes, using different methods and including periods of non-use and other reproductive behaviour across the whole study period.

Appendices

Appendix 3A
Focus Group Question Schedule

1. Introduction

Thank you all for coming today and taking part in this study. My name is (NAME) and I will be leading this discussion and this is (NAME OF ASSISTANT) who will be helping me. She will not be participating in the discussion but will just be listening and taking some notes. Before we begin I am going to tell you all about the study and exactly what is going to happen so that you can make sure that you want to carry on and you will know what to expect.

INFORMED CONSENT PROCEDURE (see appendix 3C).

We are really interested to hear what you think about these issues so please do not think that there is any right or wrong answers and feel free to say what you really feel. We want you to feel comfortable and just chat like you would if you were talking to friends. I have a list of the topics we want to cover but you will also be able to add anything else you think is important that I have not asked about. Finally we are interested in everyone's opinions so please try to let everyone have a chance to speak. So, if everyone is ready we will turn on the tape now and begin.

2. Opening questions (Ice Breaker)

Can we please go around the group and introduce ourselves. Please tell us:
Your name
How old you are
Are you married or not
Who else is living with you in your household?

3. Discussion of family planning

So, you have all heard about family planning but from where did you first learn about it?
Where do you get information about family planning now?
(IF NEEDED) Do you discuss family planning with other people?
Who do you discuss family planning with?
In what sorts of situation do you discuss family planning?
If you wanted advice about family planning who would you talk to?
Who do you think would give you the most reliable advice about family planning?
Is there anyone you would not talk to about family planning? Why not?
What sorts of things do people say to each other when they are discussing family planning?
When people are discussing family planning do they tell each other about good experiences they have had? And bad experiences?

4. Side effects

So, we just mentioned that sometimes when they are discussing family planning people tell each other about bad experiences they have had. I would like to know more about this.
You have mentioned side effects can you give some examples of what that might be?
Are side effects related to using a particular method of contraception?
How do you know about side effects?
Who gets side effects?
What can a person do if they have side effects?

5. 'Fear of side effects'
When people say they are afraid of side effects what do you think they mean?
For example:
Are they afraid of being sick? Or of dying?
Are they afraid they will not be able to get help?

Are they afraid of something happening now?
Or in the future?
Do you think all of the stories about side effects are true?
Do you think people spread rumours about using contraception? For what reason?
Do people believe them?
Do you think fear of side effects influence peoples attitude to family planning?
Do you think fear of side effects might influence whether people use contraceptives or not?
Would it influence what type of method people used?
Would it make a difference where they heard about side effects? Or from whom?
Do you think there is anything that could be done to make people less afraid of side effects?

6. Closing questions

So, I think we have covered everything now. Before we finish is there anything else you would like to add?

Okay so we are going to end the discussion and turn off the tape now. Thank you very much for participating and I hope that you enjoyed it.

Probes
Can you explain that further?
Can you say more?
Could you give an example?
Please say more.
I don't understand.
Please describe what you mean.

Appendix 3B
Study Information and Screening Questions

Hello, my name is (NAME) and I am conducting a study here in (NAME OF VILLAGE). The Study is about family planning and contraceptive use and we are looking at how people get information about family planning and how they share information with others. Specifically we are interested in what people think about the side effects of contraceptive methods and how they learned what they know about this issue. Is it okay for me to ask you a few questions to see if you would be suitable to participate in the study?

Screening Questions

Do you live in (NAME OF VILLAGE)? YES NO

How old are you? _____

Have you ever heard about family planning and contraceptive use?

YES NO

I would like to ask you to participate in the study I just told you about. You would need to come to (LOCATION OF FOCUS GROUPS) and have a discussion with around 6 other women from this village about family planning and how you share information. It would take about 2 hours and you would receive a small gift to thank you for taking the time.

Are you interested in taking part? YES NO

If NO, Thank them for their time.

If YES, Provide them with details of an appropriate group and take their contact details if appropriate

Appendix 3C
Verbal Informed Consent Procedure

Study information
This study is being conducted by Claire Bailey who is a research student studying for a PhD at the University of Southampton in the UK. The study is part of the PhD Thesis and will help Claire to complete her studies. Claire is working here in Ghana with the help of staff at the University of Cape Coast but her research is independent and she is not associated with any government or non-governmental organization. Claire's study and this research is being funded by a UK government department called the Economic and Social Research Council. The results of the study will hopefully be published in a journal so that other researchers can understand the research but there will not be any direct intervention here in the village based on the results of the study.

Neither Claire nor the other members of the research team are doctors or nurses or otherwise medically trained. We will not be able to help you with specific medical problems or provide medical advice or advice about family planning. If you have a specific problem we may be able to give you information about where you can go for help but that is all.

The study is all about contraceptive use among women in Ghana and specifically it is interested in the issue of people being afraid to use contraception because of possible side effects. We would like to know more about this issue from you and would like you to discuss this within the group. You will be asked to talk about how you get information about family planning and who you talk about it with. We will also discuss what you know about side effects and how you think that affects whether or not people use contraceptives. We are interested in your thoughts and opinions. We would also be happy for you to discuss your own personal experiences but you do not have to if you don't feel comfortable.

Whether or not you participate is totally up to you and you should not let anyone else decide this for you. If you decide to start the study but then later change your mind you can stop whenever you want and leave if you want and that will be no problem. Also if you want to continue with the study but do not feel comfortable talking about a particular topic or answering a question you may say so and not answer that part but still carry on with the rest of the discussion. If you have any questions or are worried about anything at any time please say something so we can make sure you are comfortable.

We will be tape recording the conversation so that later on we can remember exactly what we talked about. No-one except the research team will ever listen to the tape. We will call each other by our names when we are here and during the discussion but when we write up what is discussed on the tapes we will not use your names at all and then the tapes will be erased. No-one will be able to tell who you are or what you said by looking at the results of the study. Only the research team and the other members of the group will hear what you say today. The research team have agreed not to tell anyone who said what during the discussion and we would like to ask you to please do the same. It is okay for you to tell people generally what you have talked about but please don't mention any names or say exactly what each person said.

Would you like to ask any questions?

Okay so just to make sure that everyone is happy to carry on I'm going to ask you a few questions.

MODERATOR: Please write the name of each participant in the space provided and then make a mark in the box if that respondent verbally answers yes to the following questions:

1) Do you understand what I have said about the research and the purpose of the research?

2) Do you understand what you are being asked to do?

3) Is it okay for you to talk about this topic?

4) Do you feel like you have had a chance to ask any questions?

5) Is it okay with you for us to tape record the conversation?

6) Do you understand that you can leave the study at any time with out any problem?

7) Do you understand that you can refuse to answer any question and still stay in the study?

8) Do you understand that we will not use your name after the discussion and we will keep what you say private?

9) Is it okay that we ask you to keep the discussion private?

10) Do you agree to take part in this study?

Participants name:	Q 1	Q 2	Q 3	Q 4	Q5	Q6	Q7	Q8	Q9	Q10

Appendix 3D

School of Social Science Research Ethics Committee Application

University of Southampton

School of Social Sciences

July 2006

ETHICS COMMITTEE APPLICATION FORM

Please note:

- **You must not begin your study until ethical approval has been obtained.**
- **You must complete a risk assessment form prior to commencing your study.**

1. Name(s): Claire Elizabeth Bailey

2. Current Position MPhil/PhD student

3. Contact Details:

Division/School Division of Social Statistics
School of Social Sciences

Email ceb504@soton.ac.uk

Phone 02380 593317 internal ext.23317

4. Is the proposed study being conducted as part of an education qualification (e.g., PhD)

Yes ☒ **No** ☐

5. If Yes, state name of supervisor (the supervisor should complete the declaration at the end of this form)

Dr Zoë Matthews

6. Title of Project:

Fear of Side Effects as a Barrier to Contraceptive Use in Ghana: Paper 3 – Qualitative Data

7. What are the proposed start and end dates of the study?

Start: 16th July 2007 End: 8th October 2007

8. Briefly describe the rationale, study aims and the relevant research questions

Rationale

Ghana was the first country in Sub-Saharan Africa to implement an official population policy in 1969 in response to the recognition by the government of high fertility and high population growth rate and their potentially detrimental consequences. This policy had only a modest impact due to lack of political commitment and was revised in 1994 to take account of emerging issues such as the HIV/AIDS epidemic[1]. The Vision 2020 Plan of Action was adopted of which the central aims are to eradicate poverty, accelerate economic development and enhance quality of life for all citizens. One goal of Vision 2020 is to have a contraceptive prevalence rate of modern methods of 50% by 2020. Knowledge of contraceptive methods in Ghana is almost universal with 98% of all women aged 15-49 reporting knowledge of at least one method. However the overall contraceptive prevalence rate remains relatively low at 20.7% for all women aged 15-49 in 2003.

Many studies have used large scale survey data to determine the socio-economic and cultural characteristics which may act as determinates of individuals contraceptive behaviour and in doing so have identified several barriers to contraceptive use. One of the issues that is consistently raised in such studies in Sub-Saharan Africa is that of the non-use of contraceptive methods due to fear of side effects. According to the 2003 Ghana Demographic and Health Survey (GDHS), fear of side effects was the most cited method-related reason for non-use among all women and is particularly cited by women aged less than 30. Fear of side effects has increased in importance as a reason for non-use between 1998 and 2003, from 18% to 26%.

While quantitative studies have highlighted this issue as a barrier to the use of modern methods, hormonal methods in particular, it remains an ill defined and poorly understood concept. It is unclear from these quantitative measures if respondents are referring to fear that a side effect of a contraceptive method will make a respondent unwell, fear that they will be unable to get medical care for a potential side effect or a perceived fear of side effects stemming from misinformation and rumours. Each of these definitions would need very different policy or programmatic intervention if the fear of side effects were to be lessened as a barrier to contraceptive use; therefore a better understanding of this issue is required.

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[1] Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR) and ORC Macro (2004) *Ghana Demographic and Health Survey 2003* GSS, NMIMR and ORC Macro: Calverton, Maryland USA online from Measure DHS at http://www.measuredhs.com/pubs/pdftoc.cfm?ID=463 cited 09/06/05

Aims

The key explanatory element in this study is the spread of information about family planning through the mass media and inter-personally through social networks. When studying mass media effects it can generally be assumed that mass media messages are promoting family planning and may reduce fear of side effects by providing trustworthy information. However this assumption does not hold for interpersonal discussion with relatives, friends and neighbours as negative as well as positive experiences may be shared and rumours and misinformation can also be spread through a social network. Discussing family planning with others may be an important influence on reproductive behaviour as studies suggest that diffusion of innovation theory states that while the mass media is effective at creating awareness and knowledge of innovations, interpersonal communication is necessary for actual behaviour change.[2]

The aim of this paper is to use a qualitative methodology to explore in greater depth the way individuals perceive information about family planning and the way such information is received and passed on to others in the specific context of fear of side effects. The study aims to better define what is meant by the term fear of side effect in this particular social context and to determine on what information and from what sources is this fear constructed. The study ultimately aims to explore how individuals feel that different types and sources of information influence attitude, opinion and behaviour in relation to contraceptive use. Concurrently the nature of the methodology provides an insight into group dynamics and informal social interaction.

Research Question

The research questions for this section of the study are:

- How do women in Ghana define the term 'fear of side effects'?
- How is information about contraceptive use passed from person to person through a social network?
- Does information received about contraceptive use from family, friends or neighbours influence attitudes towards contraceptive use, specifically fear of side effects?
- If so are particular people or types of information more or less influential?
- Does fear of side effects influence contraceptive behaviour and act as a barrier to the use of modern or hormonal methods?

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[2] Hornik, R & McAnany, E. (2001) *Theories and Evidence: Mass Media Effects and Fertility Change* Communication Theory 11 (4): 454-471 online from EBSCO at http://ejournals.ebsco.com/direct.asp?ArticleID=QK962UBR85GRWVRA07GM> cited 02/07/05

9. Briefly describe the design of the study

This study forms one paper of a three paper PhD in which the issues of inter-personal discussion and fear of side effects are explored using three different methodologies and three different sources of data. Based on the same rationale each paper is essentially asking the same question of all three data sources but in each paper different aspects of the issue are being brought into focus by the differing methodologies. The first paper uses the Ghana 2003 Demographic and Health Survey data and multi-level logistic regression analysis to take a nationally representative look at the association between exposure to family planning information, through mass media and interpersonal channels, and the probability that a respondent will cite fear of side effects as their main reason for not intending to use a contraceptive method in the future. The second paper overcomes the inherent limitations of a cross-sectional survey by using a longitudinal data set collected in the Cape Coast region of Southern Ghana. This paper will explore the relationship between knowledge of bad health effects from using modern contraceptive methods and the probability of subsequent adoption of such method. It is the third paper for which ethical approval is currently being sought and the aims and research questions related to this study are detailed above.

The qualitative data collection will be carried out in two village locations in Central Region and Western Region, Ghana. In order to spatially tie the different elements of the research together the locations have been chosen from the six locations used as data collection areas in the longitudinal study on which another paper in the thesis is based. The two villages have been chosen primarily for practical purposes, based on their location and proximity to each other and to the University of Cape Coast which is the base location for the fieldwork. These two villages also share a common local language which reduces the need for multiple translations. The study locations will remain flexible until arrival in the field when they will be formally decided in light of actual field conditions.

The methodology used for primary data collection is focus group discussions (FGDs). Upon arrival in the field a team of two research assistants will be hired and trained to act as moderator and assistant moderator for the FGDs as well as contributing to the specific wording of the materials to be used in the research. The research assistants will be female students or staff members of the Faculty of Social Sciences of the University of Cape Coast and will be recruited with the assistance of the Dean of the Faculty. The research assistants will be fluent in both English and the local languages (Twi and/or Fante).

12 focus groups will be conducted with 6-8 participants per group and organized in a multiple-layer design specified as follows:

	Aged 30 or under	Aged over 30
Village 1	3 groups	3 groups
Village 2	3 groups	3 groups

The groups are split by age based on the previous findings of the 2003 Ghana Demographic Health Survey which suggested differentiation on the issue of side effects among respondents in these two aged groups[3].

A preliminary copy of the focus group schedule is attached as appendix A. This schedule is subject to changes in wording in consultation with the research assistants who will be moderating the focus groups in order to use language appropriate to the local context and with which the moderator feels comfortable. The schedule may also be translated into a local language by the research assistants, although current advice suggests that this may not be necessary as the local languages do not have a strong written tradition and the research assistants may prefer to work with written English. This applies to all written material to be used in this research.

10. Who are the participants?

The participants in this study are women in the age range 18-49 residing in one of the two study locations. They may be users or non-users of modern contraception but they will at some time in their lives have discussed family planning or contraception with someone else. Homogeneity of the groups is important in order to create a comfortable and permissive environment for the participants and aid in the analysis of the data across groups. By the design of the focus groups participants will be homogenous on the grounds of gender, age, and village of residence.

11. How will they be identified, approached and recruited to the study?
(please attach a copy of the information sheet if you are using one)

Participants may be identified in a number of ways but the following three strategies identified by Krueger and Casey (2000) are deemed to have the most potential for this study:

- Obtain lists of people with the chosen observable characteristics from community organizations or village administration and sample potential participants from those lists.
- Piggyback focus groups. Identify local meetings or events at a place where participants come for recreation, shopping or some other purpose and then stop potential participants to ask screening questions then invite them to participate in a focus group.
- Snowball sampling. Once some participants have been identified use them to recruit/identify further potential participants.

The actual identification of participants will be finally decided taking into consideration the field context and the local knowledge of the research assistants but at this stage it is felt that piggy back focus groups have the most practical

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[3] Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR) and ORC Macro (2004) *Ghana Demographic and Health Survey 2003* GSS, NMIMR and ORC Macro: Calverton, Maryland USA online from Measure DHS at http://www.measuredhs.com/pubs/pdftoc.cfm?ID=463 cited 09/06/05

potential for this study. This strategy for identifying participants mentions the possibility of conducting the groups very close to the original meeting or event both in time and place but this does not have to be the case and participants can also be recruited for a focus group conducted at some other time.

Once identified on the basis of observable charichteristics participants will be approached by a research assistant and given a short verbal introduction to the study they will then be asked a few screening questions to determine their suitability and into which group they should be placed. If the participant expresses interest in taking part they will be invited to a group and given the required details. The introductory information and screening questions are attached as appendix B.

12. How will you obtain the consent of participants?
(Please attach a copy of the consent form if you are using one)

The process of gaining informed consent is central to the research process. Legal definitions of consent comprise three elements, capacity, the ability to make rational decisions, voluntariness, decision-making free of coercion, and information, being fully and effectively advised of the implications of participation.[4] The basic principle of informed consent is that participants are given enough information to allow them to make decisions about the potential risks and benefits of participation.[5] The process of informed consent usually involves a written information sheet and a form to be signed by the participant formally giving consent. However this process does not take into account the socio-cultural setting of this study in which a proportion of the potential participants can reasonably be expected to have low literacy skill and a limited educational background. According to UNESCO statistics the adult female literacy rate in Ghana for 200-04 was 65.9%, which suggests that given a random sample one could expect one third of potential participants to be illiterate.[6] Van Den Hoonaard[1] points out that informed consent must be tailored to the circumstances of the potential participants and take into account participant's skills including level of reading recognition and comprehension. Further to this Oliver (2003) notes that a way should be found to explain the basics of the research to the participants in a manner which they understand which may involve overcoming limitations of language and limited education. [7]

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[4] Van Den Hoonaard, Will C. (Ed.) (2002) Walking the Tightrope: Ethical Issues for Qualitative Researchers University of Toronto Press: London
[5] Gregory Ian (2003) Ethic in Research Continuum: London
[6] UNESCO (2005) EFA Global monitoring Report 2005 online from UNESCO at http://portal.unesco.org/education/en/ev.php-URL_ID=35313&URL_DO=DO_TOPIC&URL_SECTION=201.html cited 23/05/07
[7] Oliver P. (2003) 'The Students Guide to Research Ethics' Open University Press: Maidenhead Berkshire

In its guidelines for research involving people in developing countries the Wellcome Trust state the following:

> 'The process [of obtaining consent] is more important than the signing of a consent form, which should only be regarded as evidence that a consent process has been carried out. Written consent may not always be the most appropriate form of recording consent, for example where participants are visually impaired or illiterate. In such cases, it is recommended that alternative forms of recording consent be used. These could include making a note of verbal consent in a participant's personalised record or making an audio or video tape.'[8]

In this study the basics of the research and the issues of anonymity, confidentially, withdrawal from the study, and audio recording will be verbally explained to participants by the focus group moderator before the discussion begins. The moderator will have a check list of items to mention and will be required to gain a verbal response from each participant at each item which will then be noted by the moderator. The explanation and the check list are included as appendix C but these may be subject to change in consultation with the local research assistants in order to ensure the terminology and phrasing is acceptable in the local context. Although not all of the participants will have limited literacy it is felt by the researcher that introducing different procedures based on education level is unnecessarily highlighting a difference to the members of each focus group. This could severely impede the discussion in the group by introduction a structure of hierarchy or status based on education level and making the less educated members of the group feel inferior or inadequate.

13. Is there any reason to believe participants may not be able to give full informed consent? If yes, what steps do you propose to take to safeguard their interests?

Other than the issues of literacy and education level previously mentioned there is no reason to believe participants will not be able to give full informed consent.

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[8] Wellcome Trust (Undated) Research Involving People in developing Countries: Position Statement and Guidance Notes for Applicants online at http://www.wellcome.ac.uk/doc_wtd015295.html#P96_10119 cited 20/05/07

14. If participants are under the responsibility or care of others (such as parents/carers, teachers or medical staff) what plans do you have to obtain permission to approach the participants to take part in the study?

N/A

15. Briefly describe what participation in the study will involve for study participants. Please attach copies of any questionnaires and/or interview schedules to be used

Each participant will take part in a focus group discussion about how people receive and pass on information about contraception, the content of this information, and in what way this information influences attitudes and behaviour. The discussion will be with a small group of 6 to 8 peers and will take approximately 2 hours altogether. (The focus group schedule is attached as appendix A). Each participant will receive a small gift, probably a food or household item such as soap or sugar, in compensation for their time. This is not intended as an incentive to attend the focus group as its primary function is not recruitment or stimulus to attend a session but rather as a token of appreciation.[9]

16. How will it be made clear to participants that they may withdraw consent to participate at any time without penalty?

It will be made clear to participants during the informed consent procedure that their participation is entirely voluntary and they may withdraw from the study at any time. It will also be made clear that participants are not obliged to discuss particular topics that they are not comfortable with and they may refuse to answer specific questions without having to withdraw themselves entirely from the study.

Gifts given to participants in compensation for their time will be given when they arrive at the study location rather then after the discussion is over to reinforce the idea that they may leave at any time and that the compensation is not dependant on a participant staying until the end of the discussion if they do not wish.

17. Detail any possible distress, discomfort, inconvenience or other adverse effects the participants may experience, including after the study, and how this will be dealt with.

The nature of the topic raises some issues which have the potential to cause distress for the participants. Issues may be raised such as recalling stressful events such as episodes of poor health due to adverse side effects or family conflict over the use of contraception which could cause a participant to become upset at the time of the discussion. In the context of a focus group it is the responsibility of the moderator to structure the discussion, encourage active

[9] Krueger, Richard A. & Casey, Mary Anne (2000) Focus Groups: A Practical Guide for Applied Research Sage Publications Ltd.: London

participation and prevent heated debates or personal attacks.[10] The moderator will also be looking out for signs of distress or discomfort in participants and will ensure that they are happy to carry on.

It is also possible that participants may be happy to get a chance to talk about their life and feel that someone is concerned for them and is listening to their story which may mitigate any personal distress felt at the time. As a result overall the participants may feel more valued and have an enhanced sense of their own self worth.[11]

It is possible that a participant may disclose personal information in the course of the discussion which on reflection they may rather not have shared which could cause then to be distressed. All participants will be asked to keep the contents of the discussion confidential during the informed consent process and this will be re-iterated to them at the end of the discussion. Of course participants' actions after the group cannot be guaranteed so there is also possible disclosure to other members of the community which all members will be made aware of.

There is also the issue that the members of each group will likely know each other in some respect and will possible have to face each other again in daily life. There are arguments within the literature about the effect of conducting focus groups with participants who know each other and there is a possibility that participants may be more reluctant to disclose personal information in a group of people they know and are likely to see again. However, in village settings such as those in this study it is virtually impossible to put together groups of participants who do not already know each other to some degree. It is felt that the topic of contraception and contraceptive use is not sufficiently sensitive as to present a problem in this regard and participants will be made aware in the informed consent process that they may refuse to answers specific questions or disclose certain personal information if they wish. One of the benefits of using focus groups discussions is that participants are free to talk in general terms about the community as a whole if they so wish rather than being forced to reveal to personal information. The researcher will also strive not to have family members participate in the same groups if possible.

18. How will participant anonymity and confidentiality be maintained?

Anonymity

The anonymity of focus group respondents will be preserved in a number of ways. As the purpose of focus groups is to compare and contrast opinion across a range of groups rather than individuals within each group it is not necessary to

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[10] May, T. (2001) *Social Research – Issues, Methods and Process* (3rd edition) Open University Press: Buckingham

[11] Oliver P. (2003) 'The Students Guide to Research Ethics' Open University Press\: Maidenhead Berkshire

maintain references to individual identity beyond the data collection stage.[12] When the interview tapes are transcribed names of individuals will not be used and where it is desirable to distinguish between individuals numbers will be assigned by the researcher. Any personal and identifying information disclosed by participants in the opening questions of the group, which are designed to get people talking and are not of substantive interest to the analysis will not be transcribed. Where participants make reference to third parties during the course of conversation any identifying information related to those third parties, such as names or addresses, will be replaced at the time of transcription with false identity data in such a way that the meaning of the conversation is preserved. Only anonymous transcripts of the data will be used for analysis and any resulting publications.

Confidentiality

Only the researcher and/or members of the research team will be present at the time of the focus groups or interviews. Only the research team, along with translator/transcribers in the event that they are not members of the research team, will have any access to the original recordings. All participants will be asked not to discuss the specific contents of their focus group discussion with other people after it has taken place.

19. How will data be stored securely during and after the study?

During the study:
Recordings from the mini-disc recorder will be uploaded at the earliest possible opportunity to the researcher's laptop which is password protected and only accessible by the researcher. In the event that these files need to be transferred to other computers for the purposes of transcription, files will be transferred by the researcher personally on a password protected USB device. Once the necessary transcription has taken place any copies of files, either audio or text will then be deleted leaving only the primary researchers lap-top and USB back-up copies. Any hardcopy paperwork related to the focus groups or focus group participants will be kept by the researcher in as secure a place as possible i.e. within locked personal or office accommodation.

After the study:
Recordings will be erased from the minidisk recorder and electronic audio files and transcripts will be stored on both the researchers' personal laptop and University file storage area which are both password protected. In the event that other forms of backup are required these will be either on a password protected USB device or on CD's which will be kept locked in a filing cabinet for which the researcher is the sole key holder. Any hardcopy material will also be kept in this filling cabinet or if no longer needed will be shredded and disposed of as sensitive waste.

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[12] Krueger, Richard A. & Casey, Mary Anne (2000) Focus Groups: A Practical Guide for Applied Research Sage Publications Ltd.: London

20. Describe any plans you have for feeding back the findings of the study to participants

There are currently no plans in place for feeding back the findings of the study to the participants. It is expected that either a final version of the resulting paper or a summary of such will be sent to the research team after the completion of the PhD. This document may also be distributed to participants who specifically request it at the time of the focus group. It is felt at this time that it is unlikely that will occur as the participants will be made aware that the only outcome of the study will be in English and will be a written document. The researcher is aware that this will limit the accessibility of the findings to the participants. Should individuals request a written document the form of this will be explained to them and their contact details will be obtained and keep secure until a summary of findings can be made available.

21. What are the main ethical issues raised by your research and how do you intend to manage these?

The main ethical issues of this research are informed consent, anonymity and confidentiality; strategies for the management of these have previously been mentioned. Other issues arise due to the sensitive nature of the topic and its context in a developing country. The fact that the study is about contraceptive use will be made clear to potential participants from the very beginning and so they will be able to judge for themselves if they consider this a particularly sensitive area and if they would be comfortable talking about this is a group context. The researcher will ensure that participants remain free from coercion and are fully informed about the nature of the study before they give their informed consent. The fact that the research is taking place in a developing country context creates an inherent power imbalance and significant cultural differences between researcher and participant. This will be managed by having the actual research conducted by local research assistants who will be asked to consult on all aspects of the research prior to data collection to ensure it is appropriate to the local context. Any possible bias in the analysis of results arising from the researchers' cultural background will be kept to a minimum through the constant awareness of the researcher of this danger and transparency in the process of analysis.

22. Please outline any other information you feel may be relevant to this submission

N/A

Please include your research proposal with this form

Appendix A – Focus group Question Schedule

1. Introduction

Thank you all for coming today and taking part in this study. My name is (NAME) and I will be leading this discussion and this is (NAME OF ASSISTANT) who will be helping me. She will not be participating in the discussion but will just be listening and taking some notes. Before we begin I am going to tell you all about the study and exactly what is going to happen so that you can make sure that you want to carry on and you will know what to expect.

INFORMED CONSENT PROCEDURE (see appendix C).

We are really interested to hear what you think about these issues so please do not think that there is any right or wrong answers and feel free to say what you really feel. We want you to feel comfortable and just chat like you would if you were talking to friends. I have a list of the topics we want to cover but you will also be able to add anything else you think is important that I have not asked about. Finally we are interested in everyone opinions so please try to let everyone have a chance to speak. So, if everyone is ready we will turn on the tape now and begin.

2. Opening questions (Ice Breaker)

Can we please go around the group and introduce ourselves. Please tell us:

- Your name
- How old you are
- Are you married or not
- Who else is living with you in your household?

3. Discussion of family planning

So, you have all heard about family planning but from where did you first learn about it?
Where do you get information about family planning now?
(IF NEEDED) Do you discuss family planning with other people?
Who do you discuss family planning with?
In what sorts of situation do you discuss family planning?
If you wanted advice about family planning who would you talk to?
Who do you think would give you the most reliable advice about family planning?
Is there anyone you would not talk to about family planning? Why not?
What sorts of things do people say to each other when they are discussing family planning?
When people are discussing family planning do they tell each other about good experiences they have had? And bad experiences?

4. Side effects

So, we just mentioned that sometimes when they are discussing family planning people tell each other about bad experiences they have had. I would like to know more about this.
You have mentioned side effects can you give some examples of what that might be?
Are side effects related to using a particular method of contraception?
How do you know about side effects?
Who gets side effects?
What can a person do if they have side effects?

5. 'Fear of side effects'
When people say they are afraid of side effects what do you think they mean?
For example:
Are they afraid of being sick? Or of dying?
Are they afraid they will not be able to get help?
Are they afraid of something happening now?
Or in the future?
Do you think all of the stories about side effects are true?
Do you think people spread rumours about using contraception? For what reason?
Do people believe them?
Do you think fear of side effects influence peoples attitude to family planning?
Do you think fear of side effects might influence if people use contraceptives or not?
Would it influence what type of method people used?
Would it make a difference where they heard about side effects? Or from who?
Do you think there is anything that could be done to make people less afraid of side effects?

6. Closing questions

So, I think we have covered everything now. Before we finish is there anything else you would like to add?

Okay so we are going to end the discussion and turn off the tape now. Thank you very much for participating and I hope that you enjoyed it.

Probes
Can you explain that further?
Can you say more?
Could you give an example?
Please say more.
I don't understand.
Please describe what you mean.

Appendix B – Study information and screening questions

Hello, my name is (NAME) and I am conducting a study here in (NAME OF VILLAGE). The Study is about family planning and contraceptive use and we are looking at how people get information about family planning and how they share information with others. Specifically we are interested in what people think about the side effects of contraceptive methods and how they learned what they know about this issue. Is it okay for me to ask you a few questions to see if you would be suitable to participate in the study?

Screening Questions

1) Do you live in (NAME OF VILLAGE)? YES NO

2) How old are you? _____

3) Have you ever heard about family planning and contraceptive use?

YES NO

4) Have you ever discussed family planning with another person (other than your husband if you are married)?

YES NO

I would like to ask you to participate in the study I just told you about. You would need to come to (LOCATION OF FOCUS GROUPS) and have a discussion with around 6 other women from this village about family planning and how you share information. It would take about 2 hours and you would receive a small gift to thank you for taking the time.

Are you interested in taking part? YES NO

If NO, Thank them for their time.

If YES, Provide them with details of an appropriate group and take their contact details if appropriate.

Appendix C – Informed consent

Study information

This study is being conducted by Claire Bailey who is a research student studying for a PhD at the University of Southampton in the UK. The study is part of the PhD Thesis and will help Claire to complete her studies. Claire is working here in Ghana with the help of staff at the University of Cape Coast but her research is independent and she is not associated with any government or non-governmental organization. Claire's study and this research is being funded by a UK government department called the Economic and Social Research Council. The results of the study will hopefully be published in a journal so that other researchers can understand the research but there will not be any direct intervention here in the village based on the results of the study.

Neither Claire nor the other members of the research team are doctors or nurses or otherwise medically trained. We will not be able to help you with specific medical problems or provide medical advice or advice about family planning. If you have a specific problem we may be able to give you information about where you can go for help but that is all.

The study is all about contraceptive use among women in Ghana and specifically it is interested in the issue of people being afraid to use contraception because of possible side effects. We would like to know more about this issue from you and would like you to discuss this within the group. You will be asked to talk about how you get information about family planning and who you talk about it with. We will also discuss what you know about side effects and how you think that affects whether or not people use contraceptives. We are interested in your thoughts and opinions. We would also be happy for you to discuss your own personal experiences but you do not have to if you don't feel comfortable.

Whether or not you participate is totally up to you and you should not let anyone else decide this for you. If you decide to start the study but then later change your mind you can stop whenever you want and leave if you want and that will be no problem. Also if you want to continue with the study but do not feel comfortable talking about a particular topic or answering a question you may say so and not answer that part but still carry on with the rest of the discussion. If you have any questions or are worried about anything at any time please say something so we can make sure you are comfortable.

We will be tape recording the conversation so that later on we can remember exactly what we talked about. No-one except the research team will ever listen to the tape. We will call each other by our names when we are here and during the discussion but when we write up what is written on the tapes we will not use your names at all and then the tapes will be erased. No-one will be able to tell who you are or what you said by looking at the results of the study. Only the research team and the other members of the group will hear what you say today. The research team have agreed not to tell anyone who said what during the discussion and we would like to ask you to please do the same. It is okay for you to tell people generally what you have talked about but please don't mention any names or say exactly what each person said.

Would you like to ask any questions?

Okay so just to make sure that everyone is happy to carry on I'm going to ask you a few questions.

MODERATOR: Please write the name of each participant in the space provided and then make a mark in the box if that respondent verbally answers yes to the following questions:

1) Do you understand what I have said about the research and the purpose of the research?

2) Do you understand what you are being asked to do?

3) Is it okay for you to talk about this topic?

4) Do you feel like you have had a chance to ask any questions?

5) Is it okay with you for us to tape record the conversation?

6) Do you understand that you can leave the study at any time with out any problem?

7) Do you understand that you can refuse to answer any question and still stay in the study?

8) Do you understand that we will not use your name after the discussion and we will keep what you say private?

9) Is it okay that we ask you to keep the discussion private?

10) Do you agree to take part in this study?

Participants name:	Q 1	Q 2	Q 3	Q 4	Q5	Q6	Q7	Q8	Q9	Q10

Appendix 3E

Letter of Research Ethics Approval from School of Social Science Research Ethics Committee, University of Southampton

University of Southampton

School of Social Sciences | Postgraduate Research Office

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Web www.socsci.soton.ac.uk

2 July 2007

Miss C E Bailey
School of Social Sciences
University of Southampton

Dear Claire

Re: School Research Ethics Committee Application

Thank you for submitting your proposal on '**Fear of Side Effects as a Barrier to Contraceptive use in Ghana: Paper 3 – Qualitative data**' for review by the School Research Ethics Committee.

I am please to inform you that the Committee is happy to grant approval for your study to go ahead.

Yours sincerely

Gill Crumplin
Postgraduate Research Office Manager

Appendix 4A

Calendar data preparation - contraceptive use status

In the calendar data contraceptive use is recorded by month in four different variables: cs1, cs2, cs3 and cs4. Contraceptive users can be recorded as simultaneously using up to four methods. In order to create one variable to measure contraceptive use dynamics over time these multiple entries must be combined.
Multiple entries occur in two circumstances:

1- Where method use is recorded in such a way that methods which are often naturally combined to make a contraceptive strategy are recorded as separate methods being used simultaneously. For example where rhythm method/periodic abstinence may be recorded simultaneously with withdrawal or condom use. On occasion the methods used together may not form a natural combination, for example using the pill and rhythm method simultaneously and those cases might be described as redundant use. The strategy for dealing with this is based on the efficacy of the method with the most effective method taking priority, as follows:

- Where one method is modern and one (or more) is traditional the modern method is recorded e.g. if rhythm and condom are both reported over the same period of continuous use then condom is used
- Where one method is reported in a consistent episode lasting 3 or more months and a subsequent method is reported simultaneous to only one month of the episode then the continuously used method is reported for that month and the episode is not considered interrupted, e.g. if a continuous episode of rhythm method lasting 9 months has one of those months also coded as condom then that month is coded rhythm.
- Where both methods are modern the following hierarchy is followed:
    i. Injection (note: injection was favoured over all others where recording injection preserved a spell of injectable use and/or preserved the minimum 3 month injectable spell length)
    ii. Pill
    iii. Condom
    iv. IUD
    v. Foam/jelly/diaphragm

  NOTE: there were no conflicting cases with sterilization and Norplant

- Where more than one traditional method is used the following hierarchy is used:
    vi. Rhythm
    vii. Withdrawal
    viii. Herbs
    ix. Other

    NOTE: Where following this hierarchy would result in one month of use of a method interrupting a continuous spell of another method then the continuous spell was preserved.

2 – The second occasion where two (or more) methods are recorded per month is at the transition periods between episodes of use/non-use. In this case the methods were not used simultaneously but rather were both used alone within a single unit of time. In these cases that month was coded as the method for which the episode is beginning. For example, if a respondent switched from pill to injection and at the month of the switch both methods were recorded then that month would be considered injection. Where there was one month of non-use recorded simultaneous to the new method then the new method was used for that month so the switch appears without a break between methods.

Appendix 4B
Example of Data File Structure

Both examples show one individual woman who contributes three different episodes of use to the dataset. The first episode is a 7 month long episode of pill use which ends in a discontinuation. The second episode is a 10 month long episode also of pill use and also ending in a discontinuation. The third episode is a 3 month long episode of injectable use which ends by being right censored due in this case to the end of the observation period (or in other case potentially due to the individual being lost to follow up).

The woman-month file structure shows that this individual contributes the first 20 cases (months) and the first 3 episodes to the data set. The individual experiences four months of side effects in total with one of those months being in the last month of the first episode of pill use. Hence this whole episode is coded 1 for variable se2 (side effect experienced in last episode of month). This episode will be considered as discontinued due to side effects provided that the episode was not followed within 9 months by a pregnancy and the individual was still at risk of pregnancy (i.e. they were not abstaining and/or their husband was not away) at the end of the episode. Side effects were also experienced in the subsequent episode of pill use and the variable se will have been coded 1 for all months of the episode to reflect this. However this episode will not be considered to have been discontinued due to side effects given that they did not occur in the last month of the episode.

The episode based file example shows that in this format time is recorded as the total length of the episode and realtime is recorded as the month the episode started. The time varying variables cannot be included in the episode based file and se and se2 capture the occurrence of a side effect in any month of the episode or in the final month of the episode respectively. The episode based example shows that variables that are fixed across

episode, such as age or method, can still vary across women. Other variables, such as ethnicity or community (not shown here), are also fixed across woman.

Example of Woman-Month file

Case ID	Woman ID	Episode ID	time	Real time	duration	method	event	se vary	se2	age
1	1	1	1	24	0-6	pill	0	0	1	16-24
2	1	1	2	25	0-6	pill	0	0	1	16-24
3	1	1	3	26	0-6	pill	0	0	1	16-24
4	1	1	4	27	0-6	pill	0	1	1	16-24
5	1	1	5	28	0-6	pill	0	0	1	16-24
6	1	1	6	29	0-6	pill	0	0	1	16-24
7	1	1	7	30	7-12	pill	1	1	1	16-24
8	1	2	1	38	0-6	pill	0	0	0	16-24
9	1	2	2	39	0-6	pill	0	0	0	16-24
10	1	2	3	40	0-6	pill	0	0	0	16-24
11	1	2	4	41	0-6	pill	0	0	0	16-24
12	1	2	5	42	0-6	pill	0	0	0	16-24
13	1	2	6	43	0-6	pill	0	1	0	16-24
14	1	2	7	44	7-12	pill	0	1	0	16-24
15	1	2	8	45	7-12	pill	0	0	0	16-24
16	1	2	9	46	7-12	pill	0	0	0	16-24
17	1	2	10	47	7-12	pill	1	0	0	16-24
18	1	3	1	69	0-6	inject	0	0	0	25-34
19	1	3	2	70	0-6	inject	0	0	0	25-34
20	1	3	3	71	0-6	inject	0	0	0	25-34

Example of Episode Based File

Woman ID	Episode ID	episode	time	realtime	method	event	se	se2	age
1	1	3	7	24	pill	1	1	1	16-24
1	2	3	10	38	pill	1	1	0	16-24
1	3	3	3	69	inject	0	0	0	25-34

Appendix 4C

Study Variable Code Book

EF	variable appears in episode based file only
WM	variable appears in women-month file only
BOTH	variable appears in both files with the same coding
Time varying	in the WM file the variable can take a different value for each month of the episode
Fixed for episode	in the WM file the variable takes the same value for each month of the episode, in the EF the value appears once per episode and can vary within woman
Fixed for woman	in the WM file the variable takes the same value for each month contributed by the same woman, in the EF the value appears once per episode and is fixed for each episode contributed by the same woman

Variable Name	File	Variable Description	Category Coding
caseID	WM	unique women-month identifier – Time varying	continuous 1 - 8937
episodeID	BOTH	unique episode identifier - fixed for episode	continuous 1 - 732
womenID	BOTH	unique women identifier - fixed for episode	continuous 1 - 476
episode	BOTH	total number of episodes per women - fixed for episode	continuous 1 - 6
time	WM	length of episode in months – Time varying	Continuous 2 - 60
realtime	WM	real time month episode begins – Time varying	Continuous 13 - 73
time2	EF	Total length of episode – fixed for episode	Continuous 2 - 60
realtime2	EF	Real time month of the first month of episode - fixed for episode	Continuous 13 - 72
event	EF	Occurrence of a discontinuation (or not) - fixed for episode	1 = event (discontinuation or switch) 0 = no event
sevary	WM	Monthly side effects data - time varying	1 = dizziness 2 = weight gain 3 = weight loss 4 = headache 5 = bleeding 6 = irregular periods 7 = painful periods 8 = cramps 9 = heart 10 = martial 11 = loss of pleasure 12 = loss of sexual function 13 = weakness 14 = other

Variable Name	File	Variable Description	Category Coding
se	BOTH	Any type of side effect experienced in ANY month of episode - fixed for episode	0 = no 1 = yes
se2	BOTH	Any type of side effect in the LAST month of episode - fixed for episode	0 = no 1 = yes
method	BOTH	Contraceptive method - fixed for episode	1 = pill 2 = injectable 3 = foam/diaphragm/jelly 4 = condom 5 = IUD 8 = rhythm 9 = withdrawal 10 = herbs 11 = Norplant 12 = post partum abstinence 15 = other
method2	BOTH	Contraceptive method – four categories - fixed for episode	1 = pill 2 = injectable 3 = condom 4 = other
method3	BOTH	Contraceptive method – modern/traditional - fixed for episode	1= modern method 2 = traditional method
panel	EF	closest prior panel interview to the first month of episode - fixed for episode	1 - 7
everpill	BOTH	women has used pill before prior to round 1 or in previous episode within calendar - fixed for episode	0 = no 1 = yes
everinj	BOTH	women has used injection before prior to round 1 or in previous episode within calendar - fixed for episode	0 = no 1 = yes
end	BOTH	event that ends episode - fixed for episode	0 = right censored 1 = discontinuation 2 = switch
abstainvary	WM	Respondent abstaining – Time varying	0 = no 1 = yes
abstain	BOTH	Respondent abstaining at the time of discontinuation - fixed for episode	0 = no 1 = yes
awayvary	WM	husband away – Time varying	0 = no 1 = yes
away	BOTH	husband away at the time of discontinuation - fixed for episode	0 = no (or episode is censored or ends in a switch) 1 = yes
preg	BOTH	woman is pregnant within 9 months of discontinuation of episode - fixed for episode	0 = no (or episode is censored, calendar period ends before 9 months or episode ends in a switch) 1 = yes

Variable Name	File	Variable Description	Category Coding
HWvary	WM	encouragement given by a health worker- month varying	0 = no 1 = yes
HW	BOTH	encouragement given by a health worker in any one or more months of the episode - fixed for episode	0 = no 1 = yes
age	BOTH	age of respondent at first month of episode - fixed for episode	1 = 16-24 2 = 25-34 3 = 35-49
event	WM	Occurrence of a discontinuation (or not) - month varying	1 = event (discontinuation or switch) 0 = no event
ethnicity	BOTH	respondents ethnicity - fixed for woman	1 = Fante 2 = Ga - Adangbe 3 = other/Denkyira/ Ahanta/ Ewe
village	BOTH	respondents village - fixed for woman	1-6
religion	BOTH	respondents religion - fixed for woman	1 = Catholic 2 = Protestant 3 = Moslem 4 = Pentecostal 5 = other/none/traditional/syncretic
educ	BOTH	respondents highest level of education - fixed for woman	0= none 1=primary 2 = middle/junior secondary 3 = secondary/ higher
ceb	BOTH	children ever born at the start of the episode - fixed for episode	0 = none 1 = 1 or 2 2 = 3 or 4 3 = 5 or more
fecund	BOTH	When you want to become pregnant, do you become pregnant quickly or does it take a long time? - asked at round 1 - fixed for woman	0 = quickly 1 = takes a long time 2 = cannot become pregnant/don't know
ideal	BOTH	ideal number of children - asked at round 1 - fixed for woman	1 = 0, 1 or 2 2 = 3 or 4 3 = 5 or more 4 = non-numerical answer*/don't know
repintention	BOTH	woman's reproductive intention (with current husband) - asked at closest round - fixed for episode	1 = wants (a)nother child 2 = wants no more (none) 3 = cannot get pregnant/undecided/don't know
discussfp	BOTH	respondent has discussed family planning with husband - asked at closest round - fixed for episode	0 = no 1 = yes 99 = don't know

Variable Name	File	Variable Description	Category Coding
encouraged	BOTH	Have you ever talked to anyone who encouraged you to use any method to space births or avoid pregnancy? - asked at closest round - fixed for episode	0 = no 1 = yes 99 = don't know
discouraged	BOTH	Have you ever talked to anyone who discouraged you to use any method to space births or avoid pregnancy? - asked at closest round - fixed for episode	0 = no 1 = yes 99 = don't know

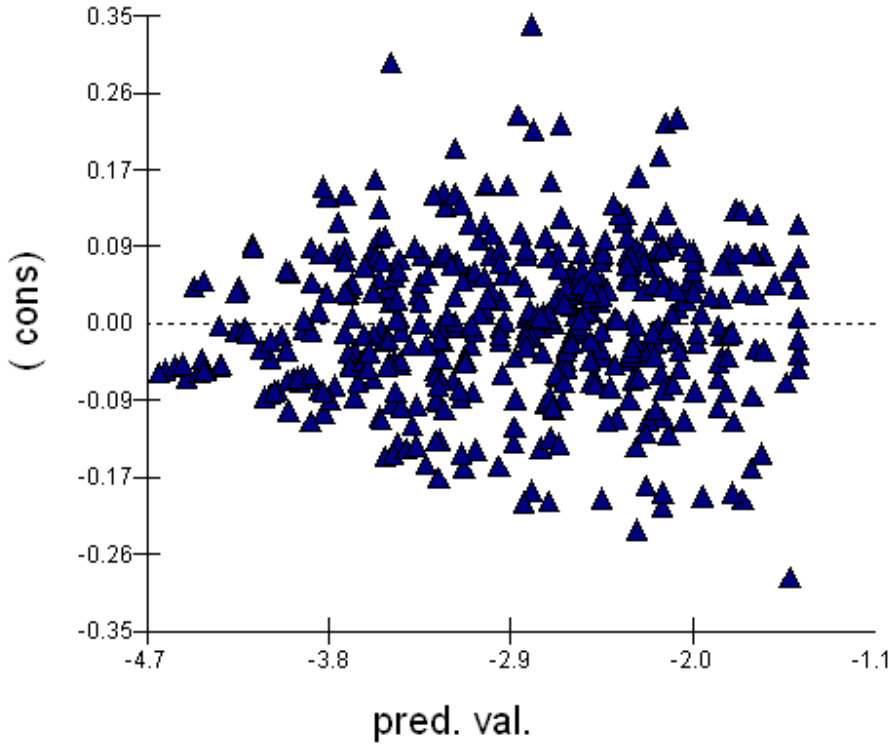
* Up to God/ all eggs in body/other

Appendix 4D

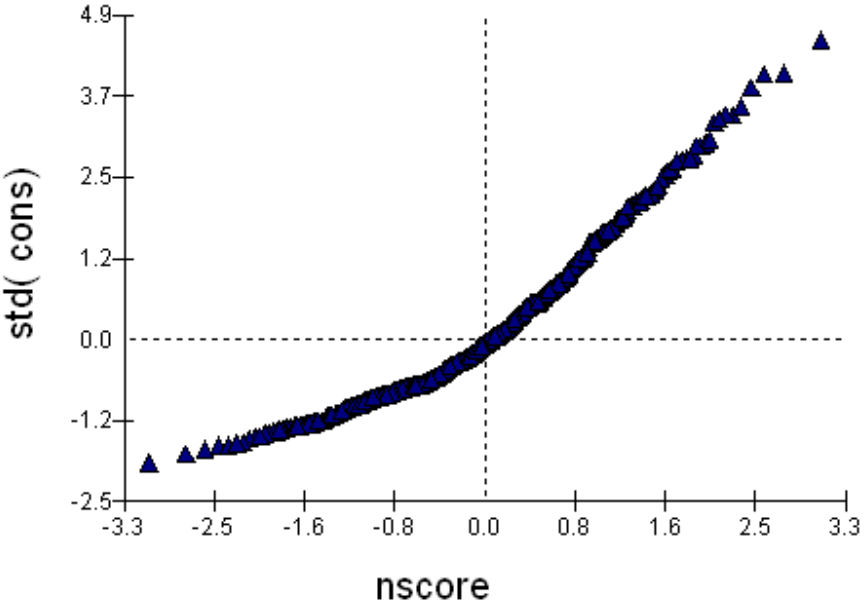
Final Model (fixed effect plus random intercept at level 2)

Residual Checks

Check of the assumption of constant variance among the individual level (level 2) residuals



Check of the normality assumption of individual level (level 2) residuals



Appendix 5A
DHS Interviewers Manual - Field Coding Instructions for Questions on Reason for Non-use of Contraceptives

The following is an extract from the DHS interviewers manual which provides the instructions for interviewers on how to field code responses to the questions related to reason for not intending to use contraception in the future:

"Q. 707: REASON FOR NOT USING A METHOD

Check the woman's response in Q. 702. If she says that she wants to have a/another child (code '1' is circled), mark the box on the left and ask the question under that box. If she wants no (more) children (code '2' circled), mark the box on the right and ask the question under that box.

There are many reasons that a person may not be using contraception, so listen to your respondent carefully. Record as many reasons as the woman mentions. The following are some guides to use in deciding which code(s) to mark:

Code INFREQUENT SEX if the respondent says she is not sexually active enough to be using a method. NOT HAVING SEX would be the appropriate code if she says she is not sexually active at all.

MENOPAUSAL means she is no longer menstruating and therefore cannot get pregnant, and HYSTERECTOMY is an operation to remove her uterus.
If the respondent says she is not using because she has not resumed menstruation since her last birth, record POSTPARTUM AMENORRHEIC.
Code SUBFECUND/INFECUND if she thinks she cannot get pregnant for reasons other than she is menopausal, has had a hysterectomy, or her period has not returned since her last birth.

FATALISTIC means that the respondent feels that the pregnancy is predetermined by fate and she has no control over pregnancy.

RESPONDENT OPPOSED means that the respondent herself does not approve of family planning. If her husband or partner is opposed to family planning, circle the code for HUSBAND/PARTNER OPPOSED. If she says she is not using because someone other than her husband or partner tells her they are opposed to her using family planning, code OTHERS OPPOSED.
RELIGIOUS PROHIBITION means that she feels her religion does not allow the use of family planning.

SIDE EFFECTS are undesirable consequences of using a method that do not adversely affect the health of the user. For example, side effects may be spotting or bleeding with the pill, while HEALTH CONCERNS may be that she heard that the pill may be linked to breast cancer.
INCONVENIENT would be if she considers the contraceptive methods to be too troublesome to use, such as being messy. This is inconvenient to use, but not inconvenient to get the method, since LACK OF ACCESS/TOO FAR is a separate category.

If the woman's main reason is not listed as a response, write her response on the OTHER line and circle 'X.' If the woman does not know at all why she is not using contraception, record DON'T KNOW."
ORC Macro (2006:105)

"Q. 711: REASON FOR NOT INTENDING TO USE

This question is asked of women who are not currently using a method and do not intend to use a method in the future. There are many reasons that a person may not use contraception, so listen to your respondent carefully. Record what the respondent considers to be her main reason for not intending to use contraception.

Only record NOT MARRIED if the respondent offers this as her reason for not intending to use a method. If the woman's main reason is not listed as a response, write her response in the OTHER category and circle '96.' If the woman does not know at all why she will not use contraception, record DON'T KNOW."

ORC Macro (2006: 106)

Appendix 5B

Variable codebook

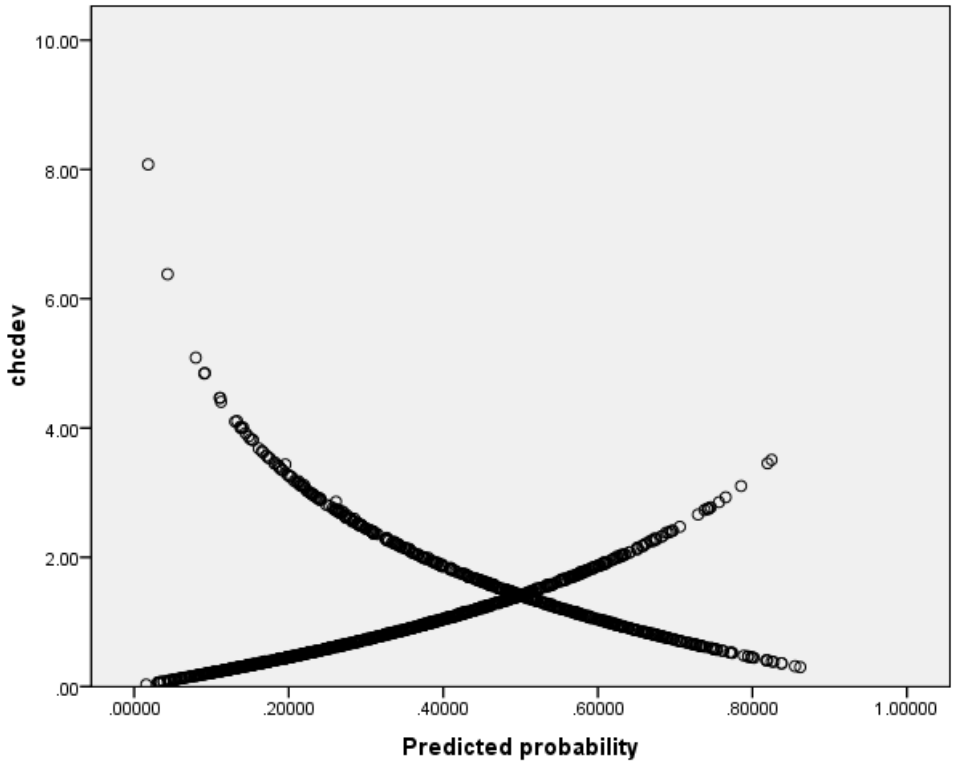
Variable name	Variable description	Variable type	Categories (RC = reference category)
mainreason	Main reason for not intending to use a contraceptive method is fear of side effects	Binary	Yes = 1 No = 0
fpdiscuss	Discussed FP with others in the past few months	Binary	Yes = 1 **No = 0 (RC)**
fpcomm	Heard a FP message at a community meeting in the past few months	Binary	Yes = 1 **No = 0 (RC)**
fphealth	Heard a FP message from a health worker in the past few months	Binary	Yes = 1 **No = 0 (RC)**
mmedia	Heard a FP message from a mass media source in the past few months	Binary	Yes = 1 **No = 0 (RC)**
ceb	Number of children ever born	Continuous	0-13
desire	Desire for more children	Categorical	**Wants = 1 (RC)** Does not want = 2 Undecided/Other= 3
activity	Recent sexual activity	Categorical	Never had intercourse = 0 **Active in last 4 weeks = 1 (RC)** Not active in last 4 weeks = 2
ever	Ever use of a contraceptive method	Categorical	**Never = 0 (RC)** Only traditional = 1 Used modern = 2
approve	Respondent approves of family planning	Categorical	Disapproves = 0 **Approves = 1 (RC)** Don't know = 8
pregnant	Currently pregnant	Categorical	**No/unsure = 0 (RC)** Yes = 1
amen	Currently amenorrheic	Categorical	**No = 0 (RC)** Yes = 1
age	Age of respondent in completed years	Continuous	15-49
educ	Respondents education level	Categorical	**No education = 0 (RC)** Primary = 1 Secondary = 2

Variable name	Variable description	Variable type	Categories (RC = reference category)
ethnic	Ethnicity	Categorical	**Akan = 1 (RC)** Mole-Dagbani = 2 Ewe = 3 Ga/Dangme = 4 Other = 5
occu	Occupation	Categorical	Not working = 0 Agri-self employed = 1 **Employed = 2 (RC)**
region	Region	Categorical	Western = 1 Central = 2 Greater Accra = 3 Volta = 4 Eastern = 5 **Ashanti = 6 (RC)** Brong Ahafo = 7 Northern = 8 Upper west = 9 Upper east = 10
religion	Respondents religion	Categorical	Roman Catholic = 1 **Christian = 2 (RC)** Moslem = 3 Traditional/spiritualist/other = 4 No religion = 0
urbrur	Type of place of residence	Categorical	Urban = 1 **Rural = 2 (RC)**
wealth	Wealth Index	Categorical	**Poorest = 1 (RC)** Poorer = 2 Middle = 3 Richer = 4 Richest = 5

Appendix 5C

Plot of change in deviance against predicted probabilities

Plot of change in deviance against predicted probabilities for Model 3 – Communication Variables, Family Planning Related Variables and Background Variables



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