Physical Gender-Based Violence and Fertility:

A Ugandan Case-Study

By

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ABSTRACT

Background Uganda has one of the highest Total Fertility Rates (TFR) in the world estimated at 5.4 children born per women in 2017. The Ugandan government has taken strides to curb fertility, due to its known social and development consequences. Numerous researchers have attempted to investigate factors that could be influencing the high fertility rates. Both research and policy have been met with only minimal success, specifically on the African continent. Therefore, new and innovative investigations are required to identify and unpack critical variables – given that efforts to date have led to slower than desirable fertility transitions in several African countries, including Uganda. Gender-Based Violence (GBV) has major Reproductive Health (RH) consequences for the victim. Women with a history of physical abuse are at increased risk for a host of RH outcomes such as high parity, inconsistent and lower levels of contraceptive use, unintended pregnancies, and adverse pregnancy outcomes. Women who have experienced GBV have also been found to seek abortion services more than those who have not experienced GBV. The effect of GBV on women's ability to control their fertility has not been widely investigated in sub-Saharan Africa and may in fact be a contributing determinant to high fertility rates in the region. Globally, as well as in Africa, a woman is more likely to be injured, raped and killed by a domestic partner, and Ugandan has high levels of physical GBV. This study aims to find the mechanisms through which GBV impacts on fertility in Uganda.

Methodology This study uses a cross-sectional dataset - the 2011 Ugandan Demographic and Health Survey. Firstly, the patterns and trends of fertility in Uganda from 1989 until 2011 are assessed, using both direct (mean CEB, mean achieved fertility and

reported TFRs) and indirect (Brass' P/F Ratio method and the Relational Gompertz Model) methods. Selected socio-demographic variables, severities of physical GBV, and RH outcomes (current use of contraception, planning status of previous pregnancy, and ever had a pregnancy terminated) were investigated using descriptive and inferential statistics. Furthermore, their association with fertility levels amongst Ugandan women were also analysed. Children Ever Born (CEB), as the measure used for fertility, is examined using both Poisson regression and multilevel models to assess the influence of individual and social determinants on fertility. Pathway Analysis determines the direct and indirect pathways, as well as the total effects, in which less and more severe physical GBV influences fertility in Uganda.

Key Findings for Objective 1 The average number of children was 21% higher for women who had experienced less severe GBV and 25% higher for women who had experienced more severe GBV, compared to those that had not. Women who were on traditional and modern contraceptives had 38% and 22% more children than those who were on no contraceptives, respectively. Those who had ever experienced the termination of a pregnancy had 53% more children than those that did not; whilst those that had planned their previous pregnancy had 19% less children than those who stated that the previous pregnancy was unplanned. Further, CEB decreases with each level of education achieved and the age at which a woman first cohabitates also shows a significant relationship with CEB – the lower the age of first cohabitation the higher the CEB. Women living in communities with medium and high percentages of women with a secondary or higher level of education had 11% and 38% less children than women living in communities where percentages were low. Women who lived in communities where the number of women who experienced less and more severe physical GBV was medium had 16% and 15% more children than women who lived in communities where either severity of GBV was low, respectively.

Key Findings for Objective 2 The RH outcomes are significant predictors of CEB and explain much of the variation in variances in CEB both between and within communities in Uganda. Physical GBV, irrespective of the severity, was also a significant predictor of CEB – moderating the effects of individual-level predictors, and household predictors to a lesser extent. Once all factors are controlled for, community level factors (except for place of residence) no longer show a significant relationship with CEB.

Key Findings for Objective 3 RH outcomes, as well as each severity of physical GBV, have significant effects on CEB – in total, but also directly and indirectly. The path models show that the total effects of physical GBV is moderated by the effect of experience of GBV on the RH outcomes. However, it is also affected by the influence of the endogenous factors as well. Furthermore, the additional direct effect of GBV on CEB suggests the cumulative importance of physical GBV in explaining variations in fertility in the country. In fact, the models which included both less and more severe physical GBV were shown to be models of better fit than the first model which did not include GBV. The effect that abuse has on the RH outcomes is amplified by the moderating effect of physical GBV.

Main Conclusion Physical GBV is a moderating factor of fertility, influencing fertility rates both directly and indirectly by moderating the effect of RH outcomes. Further, both severities of GBV were found to influence fertility directly and indirectly through the three

RH outcomes – the effects and magnitude were different. Unmet need for contraception in Uganda is extremely high for all women, but it is particularly worrying that young women or women whom have not experienced fertility are not using contraception to avoid early pregnancy and to limit births. Extremely young ages at first cohabitation contributes significantly to both high incidence of physical GBV (both less and more severe), as well as fertility levels in the country. Women who cohabitate at such young ages have lower chances of completing education, assuring gainful employment, and having the means to opportunities that could increase their empowerment and further decrease the risk of GBV and reach their desired family size.

Policy and Research Recommendations Programmes aimed at increasing women's educational status (including programmes at school), behaviour change communication strategies to decrease the incidence of early age at first cohabitation, and family planning programmes at public health facility must all be complimented with pro-active measures dealing with violence in intimate relations. This should also include men. Future research should include partner-level factors and analyses on partner socio-demographic asymmetries, as well as cultural factors. Path models should be investigated in other contexts where pathways may differ – such as in South Africa which has lower fertility levels but high levels of GBV.

Key Words Fertility, Physical Gender-Based Violence, Children Ever Born, Reproductive Health Outcomes, Pathway Analysis, Multi-Level Analysis

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AIDS	Acquired Immuno-Deficiency Syndrome
AIC	Akaike Information Criterion
ARV	Antiretroviral
ASFR	Age-Specific Fertility Rates
AU	African Union
BIC	Bayesian Information Criterion
CDC	Centre for Disease Control
CEB	Children Ever Born
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
CFI	Comparative Fit Index
DHS	Demographic and Health Survey
DEVAW	UN Declaration on the Elimination of Violence Against Women
DV	Domestic Violence (Alternatively referred to as Intimate Partner Violence (IPV) or Gender-Based Violence (GBV))
GBV	Gender-Based Violence
GDP	Gross Domestic Product
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
ICPD	International Conference on Population and Development
IPV	Intimate Partner Violence
IRR	Incidence Risk Ratio
OR	Odds Ratio
PAS	Population Analysis Software
PCV	Percentage Change in Variation
PRB	Population Reference Bureau
RH	Reproductive Health
RMSEA	Root Mean Squared Error of Approximation
SES	Socioeconomic Status

SRMR	Standardised Root Mean Squared Residual
STI	Sexually Transmitted Infection
TB	Tuberculosis
TF	Total Fecundity
TFR	Total Fertility Rates
TLI	Tucker Lewis Index
UBOS	Uganda Bureau of Statistics
UCLA IDRE	University of California, Los Angeles Institute for Digital Research and Education
UDHS	Uganda Demographic and Health Survey
UN	United Nations
UNHS	Uganda National Households Survey
UNFPA	United Nations Population Fund
UNGA	United Nations General Assembly
USA	United States of America
VAW	Violence Against Women
VIF	Variance Inflation Factor
VPC	Variance Partition Coefficient
WHO	World Health Organisation

DEDICATION

I dedicate the success of this work to my grandparents – Maria Manuela Da Silva Lobo Passos and Alberto Passos. VÓVÓ and VÔVÔ – this was your dream too, and I did it!

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First and foremost, I want to thank my family. To my children – Dario, Mikael and Luca Frade-Bekker. You gave me the power to succeed and reminded me of my strength and confidence every single day, even when it seemed impossible! I did this for you! Thank you, a million times, for the sacrifice that you made for me to complete this. I will explain one day when you are old enough what you did, and how I appreciate this more than words can ever express. I love you more than anything in this world, my angels, you are the best thing that ever happened to me!

To my husband, you patiently supported and believed in me even through the tough times. Thank you for always encouraging me and reminding me that I was always closer than the day before. I know how hard this was on you, and how absent I was at certain times. I love you, and thank you for standing by me, when it was hard for you to understand.

My wonderful belated grandparents, thank you for the love and support, for always believing I had something special in me, and giving me my love to learn. I truly hope that I have become half of what you were, and that I leave even a modest footprint of what you made on this earth. You are forever my guiding stars. I miss you so much every day!

To my mother (Adalberta Coimbra), my father (Venancio Frade), and my big baby sister (Andreia Frade aka Fooney). The ever-present support, love and encouragement helped me so much – I couldn’t have done it without you. No words could ever express how thankful I am for the happiness and congratulatory messages even for the small milestones, for believing in me when I had stopped believing in myself, and for the support structure you created for the boys during my journey to make sure they never felt neglected or that I wasn't able to give them the attention they needed and deserved. To my mother in law, Anita Bekker – thank you for telling me it was time to go back when I had given up and for always believing that I deserved this. To both you, and my father in law, Andre Bekker, thank you equally for taking the boys for their "weekends away" and making it special for them and helping me to cope. I love you all.

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and my family is just beyond measure. In the short time we have known you, you have given so much, and I only hope that we can one day repay you.

DECLARATION

I, Sasha FRADE, declare that this thesis is my own original work. It is being submitted for the degree of Doctor of Philosophy in Demography and Population Studies at the University of the Witwatersrand, Johannesburg (South Africa).

To the best of my knowledge, it has not been submitted before, in part or in full, for any degree or examination at this or any other University

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CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Background of the Study

Fertility rates in sub-Saharan Africa have not matched the decrease of mortality rates in other world regions over the past several decades. As such, population growth has continued throughout this time (Ainsworth, 1996; Bongaarts & Casterline, 2013; Dow, 1970). In fact, the region in the world that has experienced the slowest decline in fertility and has the highest number of countries with women still having more than 4 children each, is sub-Saharan Africa (Caldwell, Orubuloye & Caldwell, 1992; UN, 2017). Furthermore, sub-Saharan Africa is the only region in the world that still currently contains several countries where the Total Fertility Rate (TFR) is beyond 6 (UN, 2017). Studies have found that fertility rates started to decline in some countries in Africa during the late 1960s and 1970s in urban areas, and about 10 years later in rural areas, although this was not uniform across all the African sub-regions (Garenne & Joseph, 2002). By the 1990s studies found that fertility rates had declined in sub-Saharan Africa but began to stall in later years – since the second part of the 1990s and early 2000s (Ezeh, Mberu & Emina, 2009; Shapiro & Gebreselassie, 2009). For instance, in a multi-country review of fertility declines in developing countries, it was found that fertility declined in all regions uniformly until around 1998. However, when these countries fertility levels were reviewed for the period between 1998 and 2004, sub-Saharan countries, on average, failed to see a further considerable decline (Doskoch, 2008; Bongaarts & Casterline, 2013).

Although fertility rates in Africa in general have declined, in comparison to other developed and some developing countries, fertility rates in Africa remain high (Bongaarts & Casterline, 2013; Handwerker, 1991; Kalipeni, 1995; Smith, 2004; UN, 2017). In fact, fertility rates in Africa are higher than anywhere else in the world (Ainsworth, 1996; Bongaarts & Casterline, 2013; Bongaarts, Frank, & Lesthaeghe, 1984; Dow, 1970; Sinding, 2009). Up until 1998, there was an annual decrease of an average TFR of 0.7 children. After 1998, this slowed down to 0.2 per year (Doskoch, 2008). In the 1990s demographic surveys found that the average TFR in sub-Saharan Africa was generally between 6 and 7 children per woman (Ainsworth, 1996), and only slightly lower at around 5.5 children per women by 2005-2010 (Bongaarts & Casterline, 2013).

Specifically, in Uganda the estimated 2017 TFR was 5.7 children born per women according to the CIA World Factbook and 5.5 according to the UN estimates for the period 2015-2020 (UN, 2017). Similarly, according to the preliminary results of the 2016 Uganda Demographic and Health Survey, the calculated TFR was 5.4 children born per women (UBOS & ICF, 2017). Uganda currently has the 5th highest fertility rates in the world according to the CIA estimates - preceded only by Niger, Burundi, Mali and Somalia according to the TFR (Statista, 2016). Although slightly lower, according to the 2017 UN estimates, Uganda has the 8th highest fertility rates for the period 2015-2020 – preceded by Angola, Burundi, Chad, DRC, Mali, Niger and Somalia (UN, 2017). The Ugandan government has taken great strides, however, to curb fertility – especially amongst adolescents. The Ugandan government has drafted the National Adolescent Health Policy, which amongst other things, which specifically addresses the high levels of adolescent pregnancy, especially given that child-bearing in the country begins at extremely young ages. Almost half of all Ugandan women are mothers by the time they reach 18, and over 66% by the time they are 20 years of age. Whilst the TFR has decreased somewhat over the past few years, adolescent fertility has increased (UBOS & ICF, 2017). Furthermore, the Ugandan government also launched the Ugandan National Population Policy Action Plan in 2008 which prioritised birth spacing and youth-friendly RH services, gender and family welfare in general (PRB, 2011).

Despite these concerted efforts, and the ongoing family planning programme in the country, fertility has decreased slowly and has remained amongst the highest in the world. As such, the response from females in Uganda to the family planning programme has remained lower than originally desired – seen by the low uptake of modern contraceptives (UBOS & ICF, 2017). Furthermore, abortion in Uganda is illegal as set out by the Constitution and the country's Penal Code, even though the Ugandan Ministry of Health launched the Standards and Guidelines for the Reduction of Maternal Mortality and Morbidity Due to Unsafe Abortion in Uganda, and a draft of the Termination of Pregnancy Bill has been completed. These documents, however, have been met with great resistance by some groups in government (Tamale, 2016). This shows that measures put in place to decrease fertility and to assure that women have access to safe alternatives to contraception, have not been met with political will or desire by all.

1.2 Problem Statement

Population growth and high fertility levels in Africa constrain development in the region (Dodoo & van Landewijk, 1996; Sinding, 2009). Therefore, various authors suggest that if fertility rates do not begin to decline faster, this could negatively affect the rate of Africa's social and economic development (Ainsworth, 1996; Dow, 1970; Sinding, 2009). Furthermore, unlike what has been seen in other regions of the world, in the few countries that have experienced even moderate to slow fertility decreases in Africa; such decreases have not been correlated to increasing levels of development as postulated in the fertility transition theory (Bongaarts, Frank & Lesthaeghe, 1984; Sinding, 2009). North and Southern Africa are currently undergoing fertility transitions (Ezeh, Mberu & Emina, 2009; Kalipeni, 1995; Sneeringer et al., 2009); whilst West, East and Central Africa have remained high fertility regions, given that fertility levels in these regions have been decreasing at much slower rates than in Southern Africa. There are, however, variations within countries and regions and even though in some countries and within some countries fertility levels have been decreasing – the rate of decrease has not been at the levels of those seen in Northern and Southern Africa (Bongaarts, Frank & Lesthaeghe, 1984; Ezeh, Mberu & Emina, 2009; Sneeringer et al., 2009; Ainsworth, 1996; Bongaarts, 2010; Kalipeni, 1995; Mostert & Hofmeyr, 1988). Even in countries where fertility decreased, in many of these cases fertility was still as high as 5 children per women well into the 1990s and 2000s (Ainsworth, 1996; Bongaarts & Casterline, 2013).

Potts and Marks (2001) confer that Southern African countries included in their study (namely South Africa, Zimbabwe, Lesotho, and Botswana) experienced the greatest deceases in fertility in the region, reaching around 3 to 4 children per women by 2001. In two-thirds of the countries in the African region there has been a much lower rate of decrease in the TFR during the interval between the last two DHS conducted since 1991 (Doskoch, 2008), compared to other regions in the world. In Uganda, specifically, the TFR was 6.2 children per women in the 2011 DHS (UBOS & ICF, 2012), and 5.4 in the 2016 DHS (UBOS & ICF, 2017). Studies have attempted to understand the slow decline and persistently high fertility rates in Uganda (Blacker, Opiyo, Jasseh, Sloggett & Ssekamatte-Ssebuliba, 2005; Vavrus & Larsen, 2003; Ntozi & Odwee, 1995; Ntozi, Nakanaabi & Lubaale, 1997) - all with differential results.

In fact, many such studies have attempted to investigate and explain why fertility rates have decreased slower in those areas in which fertility rates remain higher than the global norm, such as in Uganda. In Uganda, the slow pace of decline and the high fertility rates are despite government's efforts to institute programmes aimed at decreasing fertility rates and amongst growing concerns by national governments and the international community at these apparent failures in achieving lower fertility rates (Ainsworth, 1996; Caldwell & Caldwell, 1990; Goliber, 1985; Sneeringer et al., 2009). Authors have disputed the reasons as to why fertility rates in Africa remain high. Numerous researchers have conducted studies to be able to understand the underlying factors for these differences – some of who conclude are socio-economic in nature, whilst others view reasons as more ethno-cultural. Shapiro and Gebreselassie (2009), for instance, concluded that the factors associated with the stall are contraceptive use, fertility preferences, women's education, infant and child mortality, and economic growth.

On the other hand, Caldwell and colleagues (1992) state that there are four main arguments as to why this slow decrease has occurred. The first views African traditional society and religion as important stressors for ancestry and descent. The second argument regards the practice of polygyny as an important factor in keeping fertility rates high. The argument that can be summarised as “strength in numbers” is the third argument put forward. Large families meant higher levels of land productivity in a system of land tenure. The final argument is that family planning programmes were non-existent or weak because politicians or bureaucrats believed that there was little demand for fertility control and did not want to be weakened by association with failure by promoting institutions seen as foreign to African culture. Given the lack of concurrence in results and the continuing higher-than-average fertility rates despite these efforts, Potts & Marks (2001) stated that there is a need to further explore the underlying (or indirect) reasons for fertility-related decisions and outcomes in the region, rather than a sole focus on the general (or direct) causes that could lower fertility further. One such potential underlying contributor to current fertility levels in Uganda is the prevalence of Gender Based Violence (GBV).

GBV is a serious health problem associated with physical, reproductive and mental health consequences (Heise, Ellsberg & Gottmoeller, 2002; Pallitto & O’Campo, 2005a). Evidence shows that physical violence in domestic relationships is almost always accompanied by psychological abuse and in one-third to one-half of all cases, by sexual abuse as well. Furthermore, the same research shows that women who suffer any physical abuse generally experience multiple acts over time. Sexual coercion and abuse also emerge as defining features of the female experience of many women and girls. Ironically, much non-consensual sex takes place within consensual unions (Heise, Ellsberg &

Gottmoeller, 2002). From forcible rape to non-physical forms of pressure that force females to engage in sex against their will. A woman lacks choice and faces severe physical consequences if she resists advances (Heise, Ellsberg & Gottmoeller, 2002). Physical abuse, therefore, is a component of GBV that could possibly impact women's fertility over time. Although such violence can have direct health consequences, it also increases the risk of female's future ill-health and limits the reproductive choices she is able to make such as opting to use contraception to limit fertility or increase the spacing between children (Gazmararian et al., 2000). Violence can put women at risk of infection and unwanted pregnancies directly – if women are forced to have sex, or from fear of using contraception or condoms because of their partner's potentially violent reaction (Heise, Ellsberg & Gottmoeller, 2002).

Organisations, service providers and policy makers around the world have also now recognised that all forms of Violence against Women (VAW), but more specifically GBV, have serious adverse consequences for women's health, but also for society at large (Heise, Ellsberg & Gottmoeller, 2002). According to Principle 4 of the International Conference on Population and Development's (ICPD) Programme of Action: "Advancing gender equality and equity and the empowerment of women, and the elimination of all kinds of VAW, and ensuring women's ability to control their own fertility, are cornerstones of population and development-related programmes…" (UNFPA, 1994). This is of concern in Africa, where fertility rates remain high, and where studies have yet to find conclusive evidence as to why fertility rates in the region have not decreased to the levels seen by other regions in the world.

GBV is one phenomenon that has major Reproductive Health (RH) consequences, but which has not been properly explored in relation to fertility levels. GBV is a form of VAW, which includes a host of harmful behaviours that are directed at women and girls' due to their sex. These include wife abuse, sexual assault, dowry related murders, marital rape, selective malnourishment of female children, forced prostitution, female genital mutilation, and sexual abuse of female children. VAW, in general, is "any act of verbal or physical force, coercion or life-threatening deprivation, directed at an individual woman or girl that causes physical and / or psychological harm, humiliation or arbitrary deprivation of liberty and that perpetuates female subordination" (Heise, Ellsberg & Gottmoeller, 2002). Intimate Partner or Domestic Violence (IPV or DV, respectively), however, is the most pervasive form of VAW as most abuse is perpetrated by domestic partners, specifically of women (Heise, Ellsberg & Gottmoeller, 2002). Globally, as well as in Africa, a woman is more likely to be injured, raped and killed by a domestic partner than by any other person (Diop-Sidibé, Campbell & Becker, 2006).

GBV in Uganda is high, and therefore the Ugandan government has placed measures to criminalise acts of domestic and gender-based violence (UBOS & ICF, 2017). However, according to ActionAid, an organisation that actively works with women victims of GBV in Uganda, 70% of women over the age of 15 years had experienced physical and / or sexual abuse at some point in their lives; and some of these cases had even resulted in death. Very few of the reported cases have led to prosecution. However, much of the work done by ActionAid is in Northern Uganda – an area which reportedly has higher rates of GBV than the other regions of the country (ActionAid, 2015). Another study conducted in Mbale District, Uganda found that lifetime experience of GBV (all forms) was 54% and 14% over the past 12 months (Karamagi, Tumwine, Tylleskar & Heggenhougen, 2006).

The 2011 Ugandan DHS (UBOS & ICF, 2012) reported similar results. Lifetime physical violence was experienced amongst 56% of women and lifetime sexual violence by 28% of women. These figures are 15 percentage points higher than the average results found in a 10-country study done by the WHO on GBV (WHO, 2012), and the most common perpetrator (as high as 9 in 10 cases) is the woman's husband or partner. Furthermore, the preliminary results of the UDHS 2016 show that women in Uganda are twice as likely to experience sexual violence compared to men, and around 22% of women aged 15 to 49 have reported having experienced sexual violence at least once in their lifetime, and 13% in the last 12 months – although variance in percentages are seen according to place of residence, age and region of residence (UBOS & ICF, 2017). The effect of GBV on women's ability to control their fertility has not been widely investigated in sub-Saharan Africa and may in fact be a contributing determinant to high fertility rates in the region.

Women who are battered by their partners experience a wide range of negative health outcomes – including mortality (Campbell, 2002; Coker, Smith, Bethea, King, & McKeown, 2000). In addition to causing injury, violence increases women's long-term risk of many other health problems including, but not limited to, physical disability, chronic pain, drug and alcohol abuse, and depression. Furthermore, women with a history of physical and / or sexual abuse are also at increased risk for a host of RH outcomes such as high parity, inconsistent and lower levels of contraceptive use, unintended pregnancies, sexually transmitted infections (STIs), and adverse pregnancy outcomes (Gazmararian et al., 2000;

Heise, Ellsberg & Gottmoeller, 2002; Pallitto & O'Campo, 2004; Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). Women who have experienced GBV have also been found to seek abortion services more than those who have not experienced GBV (Gee, Mitra, Wan, Chavkin & Long, 2009). Pallitto and O'Campo (2005a) found that Colombian women who lived in areas that had a high rate of GBV had a 2.5 times higher likelihood of having an unintended pregnancy, the same authors also found in an earlier 2004 study that violence towards women at the individual level was also linked to a higher level of unintended pregnancies (Pallitto & O'Campo, 2004; Pallitto & O'Campo, 2005a).

In a study conducted in Tanzania it was found that violence decreases with women's age – showing that there is a decrease in violence against women over the age of 45 years, once women have completed their fertility. In fact, violence amongst the Tanzanian women in this study increased between the early 20s and late 30s. The higher prevalence of violence during the women's childbearing years was thought to be, according to the researcher, due to the marriage contract which is structured around the woman's fertility – men punish women if they do not fulfil their contractual obligations and meet the men's preferred fertility desires. This shows an underlying tension between men and women's fertility preferences (Gonzalez-Brenes, 2003).

Furthermore, in a study conducted in Uganda, women reported that they were at times abused by partners if they had voiced desire to access contraception (Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). Ultimately, these RH outcomes, and the fact that GBV contributes to the lower or higher reported incidences of these RH outcomes, could in fact have a commensurate effect on fertility rates in the country as well by increasing women's total number of children ever born.

The one study that has attempted to investigate whether GBV is a proximate determinant of fertility, as opposed to only looking at the RH outcomes of gender-based violence, was conducted by Odimegwu and colleagues (2015). These authors conclude that there is an association between GBV and fertility in 2 out of the 3 countries included in the study (Nigeria, Gabon and Zambia). Using Poisson regression, the authors found that fertility was higher amongst those who has experienced gender-based violence, compared to those who had not (in Nigeria and Zambia), but did not find a significant relationship in Gabon. The study does not investigate the relationship between GBV and fertility in further detail or attempt to investigate the pathways in which GBV may be contributing to fertility, only looked at currently married women (which precludes those who may have been in intimate relationships but were not married), and do not look how the severity of GBV could impact fertility differentially. Furthermore, the study did not include Uganda – a country with both persistently high fertility rates and prevalence of GBV. The study itself includes few socio-demographic factors, but none of the RH factors that have been found to be affected by GBV, and which could in fact be the direct factors in which GBV acts upon to increase fertility rates. This is even though the authors themselves state that the hypothesised relationship was premised on the fact "that women who experience (GBV) are less likely to use modern contraceptives" (Odimegwu, Bamiwuye & Adedini, 2015). This hypothesis, however, is not incorporated into their investigation.

Therefore, the current study repudiates the claim that GBV is a proximate determinant of fertility. It is hypothesised that GBV is a mediating factor that both directly and indirectly works through RH outcomes, as well as key socio-demographic factors, to affect fertility levels – and not as a direct or proximate factor of fertility. Furthermore, this study hypothesis that the severity of GBV acts upon fertility and RH outcomes differently, given that a less or more severe case of GBV has different consequences both physically and emotionally.

Gonzalez-Brenes (2003) concurs, concluding in her paper titled *Gender-Based Violence, Bargaining and Fertility in Rural Tanzania* that there is a need to explore the relationship between the prevalence of violence and fertility rates in society, and to investigate the determinants and pathways of this relationship. Therefore, what is essential, is to understand the direct and indirect ways GBV impacts on fertility and provide a framework within which to understand this relationship scientifically; but also, to understand how the severity of GBV may act upon this relationship in different ways. Such a framework can be used to model programmes that aim to decrease both GBV and fertility, but also address different severities of GBV as well.

1.3 Purpose Statement

The purpose of this study was to examine the relationship between physical Gender-Based Violence (GBV) and fertility, controlling for Reproductive Health (RH) outcomes and other individual level and contextual socio-demographic factors. To do so, this secondary analysis included both multi-level models, as well as pathway analysis, using a sample of Ugandan women of reproductive age who responded to the gender-based violence module in the 2011 Ugandan Demographic and Health Survey. GBV has been generally defined using the definition provided by the UN Declaration on the Elimination of Violence Against Women (DEVAW) "*Any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivations of liberty, whether occurring in public or in private life*". For the purposes of this study GBV included both less and more severe physical violence, coercion or arbitrary deprivations of liberty perpetrated by an intimate or spousal partner. This is also often termed physical Domestic Violence (DV) or Intimate Partner Violence (IPV).

Fertility has been generally defined as the bearing of children and has been measured using Children Ever Born (CEB) for the multivariate analysis. Descriptive analyses also included other fertility measures including Total Fertility Rate (TFR), Age-Specific Fertility Rate (ASFR), Mean Achieved Fertility and Mean CEB. The control socio-demographic factors and the intervening RH outcomes (current contraceptive use, intention of previous pregnancy, and ever had a pregnancy terminated) were statistically controlled for in the study.

1.4 Research Questions

1. Does less and more severe physical Gender-Based Violence contribute to fertility levels in Uganda?
2. What are the pathways through which less and more severe physical Gender-Based Violence affect fertility in Uganda?

1.5 Research Objectives

1.5.1 General Aim

This study aims to examine the relationship between less and more severe physical Gender-Based Violence and fertility in Uganda.

1.5.2 Specific Objectives

1. To examine the levels, trends and differentials of physical Gender-Based Violence and fertility amongst Ugandan women.
2. To examine the individual and social context of fertility with physical Gender-Based Violence in Uganda.
3. To determine the direct and indirect pathways through which physical Gender-Based Violence affects fertility in Uganda.

1.6 Significance of the Study

Fertility rates in Africa remain high, despite concerted efforts by African governments and stakeholders to implement programmes to decrease the levels of fertility in African countries. In fact, sub-Saharan Africa is the region that has experienced the slowest decline in fertility over the preceding decades (Makinwa-Adebusoye, 2007), although more recent work completed by Shapiro and Hinde (2017) shows that the pace of decline has begun to surpass that of Asia and Latin America. Albeit that this may be due to the lower levels of fertility in the two latter regions. The fact that these countries have family planning programmes that offer a wide variety of contraceptive choices but that fertility rates remain high is worrisome and warrants research in other areas to find possible reasons for this pattern (Ijaiya, Raheem, Olatinwo, Ijaiya & Ijaiya, 2009). Studies have found that Africa seems to be the region that has been least responsive to family planning programmes. One argument put forward is that family planning programmes in the region have not considered the cultural context in which decisions on family planning use are not solely the decision of the woman, and in some places, men may even have more say than the woman in the relationship (Dodoo & van Landewijk, 1996). In a study on Ghana, Dodoo and van Landewijk (1996) found that if one were to include male perspectives on desired family size and see these decisions as a couple rather than an individual decision made by women only, then unmet need in the country would decrease by 50%. The authors conclude that "the findings underscore the validity of an argument for including men in our attempts to understand and/or manage the dynamics of fertility behaviour and population growth in sub-Saharan Africa". In fact, these authors state that the notion of unmet need should incorporate both male and female reproductive preferences, or at least account for male influence in such decisions.

Such considerations of disagreement between the male and female partner in the union goes beyond simple decision-making but encompasses concerns regarding power dynamics in making such decisions and which, in effect, extends to the concern regarding the role that GBV plays in increasing the levels of inconsistent contraceptive use, unintended pregnancies (Kaye, Mirembe, Bantebya, Johansson & Ekstrom, 2005; Nalwadda, Mirembe, Byamugisha & Faxelid, 2010), as well as increased incidence of abortion (Gee, Mitra, Wan, Chavkin & Long, 2009). Potts and Marks (2001) show that there has been a slight increase in the concern of women's power (or lack thereof) in marriage and sexual relationships. They note that it is also often the case that it is impossible for most women in Africa to ask their partners to use a condom; which would ultimately lead to unprotected sex and increased risk of falling pregnant (Potts & Marks, 2001). The same can be said over contraceptive use, and thus simply considering female's unmet need into family planning considerations is insufficient to decrease fertility rates. Thus, there is a need to include power dynamics and experiences of GBV within the couple when establishing true unmet need for contraception, unintended pregnancies and therefore the number of children born in a household. This is especially true given the low rates of uptake of contraceptive use in many sub-Saharan African countries and could be a reason for higher levels of fertility in the region. Thus, some authors have noted that still much remains to be studied to gain a better understanding of the fertility transitions in Africa (Garenne & Joseph, 2002).

To understand high fertility in sub-Saharan Africa research has looked at the failure of family planning – often leading to mixed results. These mixed results have been associated to the influence that determining factors have on the success or failure of family planning programmes, such as women's education, the cost of contraceptives, and the level of unmet need for contraception, amongst others (Caldwell & Caldwell, 1987; Ezeh, Mberu & Emina, 2009; Letamo & Letamo, 2001; Mbacke, 1994). However, the role that other determinants could have on the continuously higher fertility rates in the region compared to other global regions, have been overlooked, such as the possible influence of GBV. Thus, there is a need to examine the extent to which GBV influences fertility dynamics in Uganda – a country with one of the highest fertility rates in the world, as well as high incidence rates of GBV. This is due to the findings that GBV influences decreasing the rate of contraceptive use and increasing the number of unintended pregnancies (Gazmararian et al., 2000; Heise, Ellsberg & Gottmoeller, 2002; Pallitto & O'Campo, 2004; Pallitto & O'Campo, 2005a) – which could have an influence on fertility rates, both directly and indirectly.

Internationally, much has been done to curb violence against women in all forms – including Gender-Based Violence. In 1979, all countries signed the Convention on the Elimination of all Forms of Discrimination Against Women, or otherwise known as CEDAW. Within CEDAW countries were provided with specific recommendations to curb discrimination against women in general. CEDAW, however, did not make any specific reference to VAW (UNGA, 1979). However, it was only in 1993 that the Declaration on the Elimination of Violence against Women was signed by the international community. The declaration itself provided a framework for which national and international policy makers and programme people could use to curb the incidence of all forms of VAW (UNGA, 1993). At a regional level, sub-Saharan African countries are also cognisant of the plight of women and girls and have recognised the need to work together, as a region, to acknowledge the extent to which VAW affects women in Africa daily. In 2003, African countries met at a Special Summit. The product of this summit was to have African countries sign and ratify the *Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa*, otherwise known simply as the *Maputo Protocol* (AU, 2003). Uganda has both signed and ratified the Maputo Protocol, but it was only in 2010 that the Gender-Based Violence Act came into effect, while the Sexual Offences Act is still awaiting adoption (Benedetti & Kijo-Bisimba, 2012). This is even though the country shows high prevalence of GBV of all forms. To date, VAW, including and most pervasively GBV, remains rampant and continues to affect women socially, economically, as well as their entire health and well-being. In fact, the report from the Expert Meeting on *Intimate Partner Violence, Non-Partner Sexual Violence and Child Sexual Abuse for the Global Burden of Disease Study* (2010) reflects on the need to better understand the pathways in which violence against women affects physical, RH and which in turn impacts on the levels of mortality and morbidity (WHO, 2013). However, this study also hypothesises that this should include the impacts that GBV has on fertility as well, if one is to understand the full breadth of the impact that GBV has on women's well-being.

This study, therefore, will help policy makers and programme people understand a further implication of GBV – and one which could affect the country at a national level, in that GBV may increase the levels of fertility. Furthermore, in providing the contextual determinants of GBV and fertility, as well as the actual pathways in which GBV acts upon fertility, through RH factors, both scientists and policy makers can draw on the study to implement a holistic model that works with women to reach their full RH desires and decrease the incidence of GBV. This would, therefore, potentially allow for optimal individual-level fertility desires and national-level fertility rates. This in turn, could affect development levels in the country. Understanding how this relationship between GBV and fertility works can therefore provide individual-level benefits, but also community-level and national-level benefits as well. Previous studies have failed to fully and conclusively allow researchers and policy-makers to account and explain for the lack of decline. Therefore, this study looks at the dynamics between GBV and fertility levels in Uganda as an additional (and hitherto unresearched) factor that could explain the slow pace of decline in Uganda – and assess how these dynamics may or may not work. This has important policy implications and may be a contributing reason to why fertility rates in the region have not led to the decreased levels seen in other countries around the world.

This study examines the extent to which GBV may be an influencing factor of fertility dynamics in Uganda. Uganda was selected as it has both one of the highest fertility levels in the world, as well as the second highest recorded rates of women who report having been abused by their intimate partner in the past 12 months (after the Democratic Republic of Congo). Furthermore, to empirically assess the hypothesised pathways - fertility rates and GBV rates were reviewed for those sub-Saharan African countries who had recently (from 2010 onwards) conducted a DHS, and which had included the Gender-Based Violence module.

The table below shows the TFR and rates of lifetime physical GBV in these countries, reported at each recent (post-2010) DHS. Amongst those countries with the highest fertility rates (those with TFRs 5.5 children per women and above); Uganda had the highest rates of lifetime physical GBV as well as the highest TFR.

Table 1.1: TFR and GBV Rates in sub-Saharan African Countries whose DHS included a Gender-Based Violence Module since 2008

Country	TFR	Physical GBV in the Last 12 Months	Lifetime Physical GBV
Nigeria 2013	5.5	11%	28%
Cote D'Ivoire 2011/12	5.0	20%	36%
Gabon 2012	4.1	22%	52%
Cameroon 2011	5.1	27%	55%
Mozambique 2011	5.9	25%	33%
Uganda 2011	6.2	27%	56%
Burkina Faso 2010	6.0	9%	20%
Malawi 2010	5.7	14%	28%
Rwanda 2010	4.6	-	41%
Tanzania 2010	5.4	33%	39%
Zimbabwe 2010 / 11	4.1	18%	30%

Source: www.dhsprogram.com

1.7 Definitions and Delimitations

Children Ever Born (CEB): or otherwise known as Lifetime Fertility, is the number of children (including those that have died after birth) born alive to women of reproductive ages until a specified reference point. CEB is calculated for women of the reproductive ages 15 to 49 years.

Fertility: the act of producing offspring. As a measure, it is the number of children born per couple, person or population.

Fertility Transition: Process in which a society moves from high fertility to low fertility rates.

Gender-Based Violence: Violence that is directed against a person based on gender. Gender-based violence reflects and reinforces inequalities between men and women. Gender-based violence and violence against women are often used interchangeably as most gender-based violence is inflicted by men on women and girls. Emotional, sexual and / or physical violence or abuse directed toward a spouse or domestic/intimate partner may be referred to as Gender-Based Violence and / or Intimate Partner Violence.

Physical Gender-Based Violence: Given the definition above as well as the question on physical violence asked in the DHS, physical GBV is defined as an act in which a woman has been kicked, dragged, strangled, burned, threatened with knife or gun or another weapon, pushed, shaken, or had something thrown at them, slapped, punched, twisted or hair pulled by husband or partner.

Reproductive Health (RH): according to the WHO, "reproductive health addresses the reproductive processes, functions and system at all stages of life." Furthermore, reproductive health "implies that people can have a responsible, satisfying and safer sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so" (WHO, 2014a). For the purposes of this study, these include unintended pregnancy, current contraceptive use, and ever having experienced a stillbirth / miscarriage / abortion[1].

[1] Due to the illegality of abortions (and therefore sensitive nature of this question) in Uganda, the UDHS 2011 did not separate the experience of stillbirths, miscarriages and abortions. These outcomes are therefore included in one variable in the dataset.

Total Fertility Rate: Average number of children that would be born alive to a woman during her lifetime, if she were to bear children at each age in accordance with prevailing age-specific fertility rates

1.8 Overview of the Study

The study contains nine (9) chapters in total. The first chapter provides both an introduction and background to the study. This chapter also outlines the purpose of the study, the study's significance, and the overall aim and objectives of the study. Chapter Two includes a comprehensive literature review, as well as the theoretical models used. The chapter outlines the final conceptual model, as well as the study's research hypotheses. A detailed explanation of the methodology is provided in Chapter Three. The chapter begins with a description of the study setting, the design of the Ugandan Demographic and Health Survey (UDHS), as well as an explanation of the sample population and research instruments used during the survey. Subsequently, Chapter Three describes both the variables used in the analysis as well as the statistical analyses conducted for the study. The final part of this chapter outlines ethical issues pertaining to the study and provides a layout of the dissemination plan for the study results.

Chapter Four presented the characteristics of the study population, whilst Chapter 5 to Seven are the chapters that present the study results. Chapter Five provides the results of the levels and trends of fertility in Uganda since 1989, as well as the results of the descriptive results (univariate and bivariate analysis) of the study population, specifically looking at the socio-demographic, GBV and RH patterns and differentials of Ugandan women of reproductive age in 2011. Chapters Five to Seven are the results of the multivariate analyses. Whilst Chapter Six presents the results of the multi-level models, and Chapter 7 provides the results from the Pathway Analysis showing the direct, indirect and total pathways and effects through which GBV impacts on fertility levels.

The two final chapters, Chapters Eight and Nine, are the concluding chapters. Chapter Eight discusses the research findings and provides an overview of the strengths and limitations of the study. Chapter Nine, on the other hand, summarises the findings of the study and outlines the conclusions. Policy implications and recommendations, as well as frontiers for future research, are the concluding sections of the study.

CHAPTER TWO

LITERATURE REVIEW AND THEORIES AND CONCEPTUAL MODELS

2.1 Literature Review

This chapter is divided into two main sections, each of which is sub-divided into sub-sections. The first section provides a review of literature with a more global perspective, followed by a sub-Saharan review of fertility related literature. The final part of this sub-section reviews fertility related literature that is specific to Uganda. The second section provides an overview of literature on the determinants of GBV, followed by the literature found on the link between GBV and fertility-related topics. Although much literature is available on fertility in Africa, hardly any of the literature found assessed any direct or indirect link between fertility and GBV. However, literature reviewed in this chapter has shown a direct link to fertility and RH outcomes, as well as direct links to RH outcomes and GBV. One of the main gaps that is evident in the literature is that although socio-demographic factors associated with fertility have been found, their associations are not uniformly significant in all contexts, neither are the relationships between the factors and fertility well understood. Furthermore, the extent to which contextual determinants explain variations in fertility in Uganda is absent from the literature. The critical review of pertinent literature, therefore, adds to the evidence that this study has important implications to programmes and policy, but also that it adds to the body of knowledge and research that has been conducted on fertility in the past.

2.1.1 Global Overview

The demographic transition theory evolved in trying to explain the demographic evolution in Western countries, moving from high mortality and fertility levels to low mortality and fertility levels (Kane & Ruzicka, 1996; UN, 1990). The fertility transition, as an extension of the demographic transition theory, is defined as the process in which a society moves from high natural fertility, to one of replacement-level fertility. However, this definition of fertility transitions ignores a considerable range of variation both within and between countries – in fact, the original explanation provided for the fertility (as well as the demographic) transition in Western Europe ignored many societal efforts that limit population growth, and only included explanations on the fluctuation of natural fertility (Bulatao & Casterline, 2001; UN, 1990).

The world, in general, began to see a fertility decline around the 1950s and 1960s – almost uniformly and simultaneously in most countries; mostly "attributed to ideologies, attitudes and mechanisms of fertility" behaviour and control that became normalised in the international community (Caldwell, 2013). Improvement in the status and empowerment of women was also found to have a positive effect on fertility decline (Kulkarni, Krishnamoorthy & Audinarayana, 2013; Upadhyay & Karasek, 2010; Abadian, 1996). The changing ideas of gender and family roles are one proximate determinant that has been attributed to this, which together with 3 intermediate determinants (the onset and speed of declines in mortality, number of surviving children, and availability and cost of post-natal forms of fertility control) are said to effectively aid the fertility transition in progressing when interacting with other key determinants associated with fertility levels (Mason, 2013). The three intermediate determinants, as well as high female employment, were also found to be determining factors in the fertility transition in a panel study of 27 European countries (Hondroyiannis, 2010).

Of all the socio-demographic factors that have been studied, the most widely studied is the effect of education of fertility (Bongaarts, 2010; Drèze & Murthi, 2001; Cochrane, 1979; Tavares, 2010; Fielding & Torres, 2009; Caldwell, 1980; Cochrane, 1983; Martin, 1995; Rindfuss, Bumpass & St. John, 1980; Kravdal & Rindfuss, 2008; Becker, Cinnirella, & Woessmann, 2010; Diamond, Newby & Varle, 1999; Martin & Juarez, 1995; Basu, 2002). Bongaarts (2010) states that education's effect on fertility works on five types of autonomy amongst women – that of knowledge, decision-making, physical, emotional, and economic and social autonomies. Thus, the pathways in which education impacts on fertility are varied, and there are several factors that may increase or decrease women's autonomy – and therefore their fertility levels. In a study conducted in the Czech Republic, it was found that the influence of higher education – together with the inability of people to combine children with work responsibilities as well as the lack of childcare facilities – was the driving force in decreasing the TFR in this country (Klasen & Launov, 2006).

On the other hand, Cochrane (1979) provides an understanding of the Easterlin Perspective of Fertility Determination – specifically looking at the possible effect of education. In her work, titled "*Fertility and Education: What do we really know*" she explains that education works on fertility in several ways throughout the transitionary period from high to low fertility rates. For one, education increases the biological supply of children, but then also reduces the desired number of children as well as the cost of regulating fertility.

Therefore, although education first increases fertility levels – as the transitionary period progresses, education ultimately decreases fertility levels in general. It is believed that education does this by working three elements included in “actual fertility” – namely, the desire for more children, the “optimum solution fertility, as well as “natural fertility”. Natural fertility being the ultimate number of children a family would have, had no measures been instituted to influence fertility (Cochrane, 1979). Cochrane (1979) is also of the view that education, on its own cannot alter fertility levels – but does so by working with other biological and behavioural factors.

Furthermore, Martin (1995) found that there is a considerable difference between lower and higher educational levels, and its levels and association with fertility decreases. However, the study showed emphatically that education can increase women’s reproductive choices, even though the relationship is not linear with actual fertility rates, and thus other factors need to be brought into account – mediating factors that may have an influence on the proximate determinants of fertility. Studies found that the strength of the association is dependent on the level of socio-economic development in the country, on social structure and the cultural context (Martin, 1995) and it is now widely acknowledged that levels of fertility are not only a product of biological factors, but of cultural factors and socio-demographic factors as well (Dow, 1970).

Other authors state that the way in which the effect of education works is that education improves women’s status and thus their bargaining power, provides them with new aspirations that could lead to them wanting smaller families to pursue such aspirations, and provides them with knowledge regarding modern contraception (Potts & Marks, 2001;

Smith, 2004). Also, other studies have found that the higher a women's education, and that of her partner, the higher the rate of contraceptive use (Kane & Ruzicka, 1996; Mostert & Hofmeyr, 1988), while other studies have found that it is community education that is the greatest predictor of whether fertility rates in an area decline (UN,1990). Further, it is believed that schools are active social agents that socialise changing norms regarding family, family size, and childbearing, both via their effects on the economics of the household as well as through their globalising normative effect on the national culture (Lloyd, Kaufman & Hewett 2000).

Studies have found a correlation between female education and contraceptive use as well, and thus its relationship in decreasing fertility levels (Ainsworth, 1996; Ainsworth, Beegle & Nyamete, 1996; Bongaarts, 2010; Thomas & Maluccio, 1996). However, these studies also find differences between countries in the magnitude of this relationship – suggested reasons for these differences have been the quality of schooling, the labour market, child health, family planning programs, and the status of women in society. However, authors suggest that due to limitations in variables in these datasets these factors have not been well studied (Ainsworth, 1996). However, a study conducted in Japan, attributed changes and decreases in fertility levels due to changes in marriage rates and in marital fertility – finding that a decline in marriage rates amongst women in their 20s was the most influential determinant for the Japanese fertility decline, followed by migration of youth during this time of their life (Sasai, 2013).

2.1.2 Sub-Saharan Africa

A few decades ago scholars were proclaiming that the fertility transition in Africa was on its way (Kalipeni, 1995), while more recently authors have stated that the fertility transition has slowed down (and in some cases, may have stalled) (Johnson, Abderrahim, & Rutstein, 2011; Machiyama, 2010). However, these studies have reached contradictory conclusions about the pattern and extent of fertility decline and stalling in sub-Saharan Africa. In general, sub-Saharan Africa has seen only moderate decreases in fertility which are attributed to many direct (or proximate) and indirect (socio-economic and demographic factors that influence fertility due to their changes on proximate determinants) determinants (Johnson, Abderrahim & Rutstein, 2011). Indirect determinants include, but are not limited to, child and infant mortality, increases in education, urbanisation, income and employment levels – which some authors associate with the process of modernisation, a key tenet of the fertility transition (Allman, 1978; Handwerker, 1991; Johnson, Abderrahim & Rutstein, 2011; Kalipeni, 1995; Kane & Ruzicka, 1996; Martin, 1995; Mostert & Hofmeyr, 1988). On the other hand, direct or proximate determinants are behavioural mechanisms that act to reduce fertility – primarily marriage or non-marriage, and contraceptive use (Johnson, Abderrahim & Rutstein, 2011).

It is, therefore critical to study the factors that affect the demand for children in determining contraceptive use, amongst other things (Ainsworth, 1996). For example, Thomas and Maluccio (1996) found that the family planning programme in Zimbabwe has been pivotal in the adoption of modern contraceptive methods in the country. However, they also found that successes have not been uniform throughout the population – where the biggest uptake has been seen in younger and more educated females. Regardless of high uptake of modern contraception, relative to other sub-Saharan African countries, fertility rates in the 1990s remained high at around 5.5 births per women (Thomas & Maluccio, 1996).

In another empirical study conducted on sub-Saharan African countries to study the impact of many birth control devices on fertility rates, the only method to control fertility that was found to be ineffective and not have any effect on fertility levels was the withdrawal method. If used correctly the contraceptive pill, injection, intrauterine device, condom / diaphragm, female sterilisation and periodic abstinence all help decrease fertility rates in a country (Ijaiya, Raheem, Olatinwo, Ijaiya & Ijaiya, 2009). However, studies have found that levels of unmet need and unwanted fertility tend to increase early in the fertility transition as a rising demand for contraception by women is largely unmet (Bongaarts, 2010). In Ethiopia, on the other hand, one study found that although fertility decreased only moderately in the country (from 6.4 to 5.9 children between 1990 and 2000), it decreased drastically in the capital urban city of Addis Ababa (from 3.1 to 1.9 children in the same period) – in the absence of a strong and effective family planning programme. This study found that the most important determining factor was the increase in delayed marriage, followed by an increase in uptake of contraceptives – mainly due to poor employment prospects and expensive housing costs (Sibanda, Woubalem, Hogan & Lindstrom, 2003).

In general, however, contraceptive use in sub-Saharan Africa has been increasing – even if only marginally – in some countries, however, such as Benin and Ghana contraceptive use has been reversed. On the other hand, in a multi-country study in 2011, Johnson and colleagues found that in some countries even an increase in contraceptive use did not mean fertility had decreased – and in fact, in some countries it had not, despite the increase in contraceptive use. In fact, the study shows that even though most countries have shown at least a modest increase in contraceptive use, this use has not been consistent – shown by the high levels of mistimed and unwanted pregnancies (Johnson, Abderrahim & Rutstein, 2011). Furthermore, there is much research that has been conducted on the differences between actual and desired fertility in Africa to discover reasons why fertility rates in the region remain high (Rafalitnanana & Westoff, 2000), and why in later years there has been a deceleration of the decrease in fertility rates in general (Bongaarts, 2007). These studies have concluded that there is a gap between the number of children women desire and the number of children ever born to them – the latter often exceeding the former, and thus leading to the conclusion that there is a high level of unwanted fertility in many African countries (Rafalitnanana & Westoff, 2000). Rafalitnanana and Westoff (2000) believe that a big reason for this as that women are not achieving the birth interval they desire between children – in fact their study shows that women prefer longer birth intervals than what they are achieving and believe that if these birth intervals were achieved this would be met with an accompanying decrease in fertility levels. However, reasons for why this occurs needs to be examined more closely even though the authors state that one reason could be the availability and efficacy of the family planning programmes and contraceptives in those countries (Rafalitnanana & Westoff, 2000).

Studies have found stark differences between fertility rates in urban and rural areas within and between countries (Machiyama, 2010; Garenne & Joseph, 2002; Shapiro & Tambashe, 2002; and Shapiro & Tenikue, 2017). Urbanisation has been found to be a key determinant of decreasing fertility rates in the more industrialised countries since studies of the fertility transition began, results regarding low fertility rates and urbanisation in African countries, however, have been mixed. Dzegede (1981) believes that this is less about the process of modernisation, and that it could be very specific socio-cultural differences between rural and urban groups within countries that may explain differences in fertility rates between these areas. This includes differences in religiosity and traditional behaviours, differences in educational achievement of the community, migration rates, the difference in age of marriage, differentials in contraceptive use and health more generally, and the general socio-economic status of the area (Dzegede, 1981). In fact, average educational level in the community has been shown to have a significant impact on decreasing fertility in the specific community – not solely individual educational attainment (Kravdal, 2002).

Urban and well-educated women in the more developed African countries are more likely to use contraception or to delay marriage, and they are therefore also more likely to experience fertility declines (Bongaarts, Frank & Lesthaeghe, 1984). In fact, studies have found that fertility rates in many African countries began to decline in urban areas as much as 10 years before they started to decline in rural areas. The reasons provided for this is that big cities provide access to modern roles and behaviours, modern health care and contraceptive use (Garenne & Joseph, 2002). A study conducted in Nigeria found the same effect of education on fertility as those conducted elsewhere – in that reaching a higher rate of education, is likely to decrease fertility from its present levels (Osili & Long, 2008). Another study also found that education was also found to be positively correlated to a decrease in fertility; as is whether a family lives in an urban or rural area (Akpotu, 2008).

Kalipeni (1995) and Lloyd and colleagues (2000) found that the Human Development Index (HDI) was a major explanatory variable for regional variations in fertility rates across Africa. The HDI is a socioeconomic index that provides equal weighting to longevity, educational attainment, and utility derived from income. Countries and population groups that had high fertility rates also had low ratings in human development (Kalipeni, 1995; Mostert & Hofmeyr, 1988). Another reason found for high rates of fertility in Africa in the study conducted by Kalipeni was the importance of status and autonomy of women in the attainment of fertility levels. The more control a woman has over her reproductive health; the more likely she is to use contraceptives and therefore decrease the number of children ever born. Handwerker (1991) states that the empowerment of women is critical for the fertility transition to occur, further Kalipeni (1995) states that one reason for the persistence of high fertility in sub-Saharan Africa is the minimal involvement of women in decision making about childbearing – noting that the HDI may be a proxy measure to female autonomy. Thus, one of the most important factors that Kalipeni and Handwerker attribute to declining fertility rates is the upliftment in the status of women. The position of women in the family and society are crucial in determining fertility patterns (Martin, 1995). In fact, Handwerker (1991) notes that:

> "African fertility generally has been high and rising over the last few decades because women continue to be dependent on childbearing for their material welfare… Studies undertaken (must) look closely at … the power relationships between women and their men, … (to) improve our understanding of the processes that lead to below-replacement fertility in today's world".

Men and women may not have the same fertility preferences, even when in a marital unit. In a study conducted in Nigeria, Mott and Mott (1985) found that married men and women in the household had different family size intentions – there was little agreement amongst spouses regarding future fertility. Thus, although in a marital union men and women have individual ideas of the best family size, which are often culturally defined. Furthermore, the study found that 72% of respondents had never discussed these issues with their spouses (Mott & Mott, 1985). In Nigeria, however, the decrease in fertility – particularly in the South – has also been associated with the increased proportion of married couples who desire no more children, due mainly because of economic hardships (Mbamaonyeukwu, 2000). While another study found that this could be more due to increased spousal communication about fertility preferences and contraception. In this study, the authors found that spousal communication about family planning, age of husbands and wives, current family size, education of couples, and exposure to media messages had significant effects on lowering fertility (Oyediran & Isiugo-Abanihe, 2002).

Religious and ethnic affiliation may also impact on fertility levels. In one study, it was found that religious affiliation was correlated to fertility levels in Nigeria, despite religious affiliation, the level of religiosity was also correlated – the more religious the person was, the higher their fertility. Catholics and protestants were found to have a higher fertility than those in Evangelical churches (Avong, 2001). Therefore, the region in which people live and the ethnic group and religion they belong to could be further determining factors to whether men positively or negatively influence women's fertility decisions, but also determine whether women desire a higher or lower number of children.

2.1.3 Uganda

Uganda 5th highest fertility rates in the world according to the CIA estimates (Statista, 2016) and the 8th highest according to the 2017 estimates for the period 2015-2020 (UN, 2017). Although fertility in Uganda remains high, studies on the determinants and factors that may be contributing to this within the country remain scant. Most of the work found regarding fertility in Uganda is viz-a-viz the country's fertility rates given the HIV epidemic in the country. These studies have found that fertility rates are higher amongst non-infected woman than for their infected counterparts which have contributed to a marginal decrease in the national fertility rates – although HIV prevalence rates have improved in the country over the past decade (Carpenter et al., 1997; Bessinger, Akwara & Halperin, 2003; Heys, Kipp, Jhangri, Alibhai & Rubaale, 2009). Authors of studies conducted in Uganda looking into the relationship between HIV and fertility in the country have renounced the possibility of this being due to increased contraceptive use or awareness of one's HIV status – given that both these variables are extremely low amongst the female population in Uganda (Carpenter et al., 1997; Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). While another study, conducted in Rakai district, found that pregnancy prevalence was reduced somewhat in HIV infected women – this was mainly attributed to pregnancy loss and lower rates of conception (Gray et al., 1998). Although one study found that in more recent year's fertility desire amongst HIV positive Ugandan women has increased, due to the availability of ARV therapies (Maier et al., 2009). What has been shown, however, is that a positive HIV diagnosis, often results in a desire for less children amongst Ugandan women (Heys, Kipp, Jhangri, Alibhai & Rubaale, 2009).

Studies that are available show that there is currently a very high unmet need for contraception in Uganda, and that women in general still want more children than women in other African countries (Blacker, Opiyo, Jasseh, Sloggett & Ssekamatte-Ssebuliba, 2005). Furthermore, a study conducted by Shapiro and Tenikue (2017) showed that major factors influencing fertility decline in urban Uganda included contraceptive use, delays in marriage and female education. Another study, with a qualitative design, reported study participants stated that they had experienced barriers to accessing contraceptives – specifically, fears and misconceptions regarding contraceptives and gender power relations. Some respondents noted that they would often be abused by partners if they had asked whether they could get contraception (Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). Another determinant of high fertility that has been found in studies conducted in Uganda was the level of schooling that a female had received (Vavrus & Larson, 2003; Bbaale & Mpuga, 2011); as are living in a poor household, limited access to family planning services and living in a rural area. This is all even though us of modern contraceptive methods in Uganda has been found to decrease the number of children ever born to a woman (Bbaale & Mpuga, 2011).

Given this high unmet need for contraception, one study found that Ugandan women use abortions to limit their number of children ever born (Gorrette, Nabukera & Salihu, 2009) – and whilst used a fertility regulator, given that abortion is illegal, such abortions often lead to maternal mortality or severe reproductive health outcomes (Gorrette, Nabukera & Salihu, 2009; Mirembe, 1996). This is even though culturally Ugandan women still have a high desire for children – Ntozi and Odwee (1995) found that Ugandan women desired around 7.8 children, whilst their husbands desired 8.9 children; concluding that a large family was still an acceptable cultural and social norm amongst Ugandans in general. Although slightly lower, more recent estimates from the preliminary results of the 2016 UDHS found that the ideal number of children amongst women was 5.1 and 6.2 for men (UBOS & ICF, 2017). Both reports, however, show that even though both men's and women's desired number of children has decreased – men's desired number of children in Uganda is still considerably higher than that of women's. This, however, has been shown to differ between rural and urban dwellers, and those of different ethnic groups; some of which practice ritual sexual practices such as return to sexual relations soon after birth and viewing post-partum abstinence as a taboo (Ntozi & Odwee, 1995).

2.1.4 Determinants and Reproductive Health Consequences of Gender-Based Violence

GBV, globally, has been found to be on average 30%, whereas there are some regions that record levels as high as 38% - women who have been abused by their partner also have a higher likelihood of reporting other health problems, as well as reporting lower birth weight babies. However, these global figures mask variations between communities, districts, countries and regions (WHO, 2013). Africa has the second highest prevalence of GBV (36.6%), preceded only by East Asia which has a prevalence of only 1% higher (WHO, 2013). Furthermore, most sub-Saharan African countries have a high tolerance for violence against women, including Uganda. A multi-country study of sub-Saharan Africa found that there was a very high acceptability of violence against women by both men and women when women transgressed social norms – such as going out without the husband's consent (Uthman, Lawoko & Moradi, 2009).

Furthermore, besides regional differences in the world, studies have found that the prevalence of GBV may be different according to ethnic groups as well, as does numerous socio-economic and demographic characteristics (Field & Caetano, 2004). In a study conducted in America in three public health facilities, 15% of women had reported GBV in the last 12 months and 51% had reported life-time GBV. Women aged 18 to 29 years had reported the highest rates of GBV; although this study did not find differences amongst those of different income groups nor between women who were employed and those that were unemployed (Bauer, Rodríguez & Pérez-Stable, 2000). The opposite was found to be true in another study conducted in the United States, which found that women in higher income households had a lower prevalence of GBV (Cunradi, Caetano & Schafer, 2002). Similarly, another study in India showed elevated economic status to have a protective effect against physical GBV, but not sexual GBV. This study further found that in communities that had a high rate of violence, there was a high household and individual prevalence of GBV (Koenig, Stephenson, Ahmed, Jejeebhoy & Campbell, 2006). Family income, educational status and level of religiosity have also been found to be negatively correlated with GBV prevalence (Vakili, Nadrian, Fathipoor, Boniadi & Morowatisharifabad, 2010; Vyas & Watts, 2009).

In analysing the individual, household and community determinants of GBV in Haiti, authors found that women with a lower educational status, women living in household where they or their partner came from abusive homes, and women living in communities in which men openly abused children were at increased risk of experiencing GBV by their husbands / partners (Gage, 2005). In Tanzania, one study found that women had a higher likelihood of GBV if they had not borne any children or if they had borne five or more children, as well as if the women were of a lower educational status (as found in other studies elsewhere in the world) or did not contribute to household living expenses (McCloskey, Williams & Larson, 2005). Other studies conducted in Africa found that wealth status, high educational level, urbanisation, access to media, and joint decision-making within the household all protect women against the incidence of GBV (Uthman, Lawoko & Moradi, 2009). In Uganda GBV has been found to be as high as between 47% and over 50%, depending on the study, amongst married women (Speizer, 2012; Ogland, Xu, Bartkowski & Ogland, 2014). In the 2011 UDHS, lifetime physical GBV was reported by 56% of women and lifetime sexual GBV by 26% of women in Uganda (UBOS & ICF, 2012).

Only one study has attempted to look at the relationship between GBV and fertility. Odimegwu and colleagues (2015) conducted analyses from three sub-Saharan African countries, assessing whether GBV acted as a proximate determinant of fertility. The authors conclusions were that GBV was in fact an unexplained proximate determinant of fertility, at least in sub-Saharan Africa. However, given the review of literature – it is more probable that GBV is a moderator factor that can act to either increase or decrease the incidence of key RH outcomes – which are the proximate factors of fertility. A small number of studies in which GBV's association with unintended pregnancies, low contraception use, and pregnancy-promoting behaviours have also been conducted. One study from Colombia looked at the effect that GBV has on unintended pregnancy (used as a proxy measure for fertility control). In this study researchers found that women were at a much higher risk of experiencing an unintended pregnancy, if they had been physically or sexually abused – although results were not uniform across the country (Pallitto & O'Campo, 2004). The same authors conducted a meta-review of literature finding links between GBV and unintended pregnancy, postulating that women in abusive relationships have a limited ability to control their fertility (Pallitto & O'Campo, 2005b). Furthermore, in a multilevel analysis it was found that women living in districts with high patriarchal control had an increased risk of experiencing GBV, as well as of unintended pregnancy (Pallitto & O'Campo, 2005a). In a qualitative study, conducted in the United States, researchers found that 74% of the 71 women interviewed stated that their reproductive decisions had been controlled by their partners, resulting in pregnancy-promoting behaviours (Moore, Frohwirth & Miller, 2010). Furthermore, in the Philippines, it was found that women who were in relationships where men dominated decision-making had an increased risk of experiencing GBV in the home (Hindin & Adair, 2002). Gee et al. (2009) report the results of their study, which examined the association between the incidence of GBV with abortion, parity and contraceptive use. These authors found that women who reported having experienced GBV, were also more likely to seek abortion services. Their conclusion was that women may be seeking abortion services because they are not able to negotiate other pregnancy prevention measures, such as contraceptive use, as abortions may be done without the knowledge or consent of the partner. Furthermore, in their study, women who experienced GBV were also less likely to report using any form of birth control measures. The authors also found that women who had reported experiencing GBV also reported a higher number of pregnancies, generally.

Over and above GBV influencing these variables, a study in India also found that GBV affected the period in which women breast-fed post-partum (Sarkar, 2008) – which influences women's fecundability. In Nigeria, researchers found that GBV lead to a lower likelihood of women using modern contraceptives, a higher likelihood of miscarriages, and having more children (Okenwa, Lawoko & Jansson, 2011). In Uganda, one study also found that high incidence of GBV contributed to a high number of unintended pregnancies (Kaye, Mirembe, Bantebya, Johansson & Ekstrom, 2006). On the other hand, researchers found that past-year GBV was not associated with pregnancy amongst native American women in another study (Malcoe, Duran & Montgomery, 2004).

A desk review of studies conducted on GBV found that very little research has been conducted on the topic and is only now being better understood. The aggregate findings of this desk review found that exposure to violence has very real consequences to women's health, often leading to numerous forms of female mortality and morbidity – including maternal and peri-natal problems. One important consideration is that evidence has shown that women that are in abusive relationships have a severely increased risk of not being able to control their RH choices – including lack of contraception and unsafe sex practices, unwanted pregnancies, low birth weight babies, and pregnancy loss, amongst others (WHO, 2013).

2.2 Deficiencies in the Existing Literature

Although many studies have attempted to investigate the determinants of fertility, as well as those of GBV – none known studies have directly or indirectly attempted to find the associations and pathways in which GBV may or may not affect fertility levels in and within the country. This is even though the same factors that seem to be related to the incidence of GBV (contraceptive use, unintended pregnancy, abortions and miscarriages) also are factors that reportedly influence fertility levels in a country. This is true in the study by Odimegwu et al (2015), which though controlling for certain socio-demographic variables, did not include the RH outcomes found to be impacted by GBV, and which could be the interlink between GBV and higher fertility rates, for example. Furthermore, while literature on the contextual mechanisms of family planning behaviour and the proximate determinants of fertility in Uganda exist since 2008 (Paek, Lee, Salmon & Witte, 2008; Sileo, Wanyenze, Lule & Kiene, 2015), there is no known literature on the contextual mechanisms of both fertility and GBV. Studies that have looked at GBV and RH outcomes do not stipulate what type or severity of GBV affects these outcomes, which is important for programmes and policies to know how to address GBV victims and their particular experience of GBV and the effects thereof.

Within fertility studies, existing studies focus on traditional determinants of fertility as identified in Bongaarts' seminal work. However, policy manipulations of these factors have not always to lead to fertility rates below 4 children per women in certain countries, such as in Uganda. The need now arises to identify and examine other potential factors that could be important determinants of fertility, over and above those that are known to affect fertility, but which have, until present, not been able to press fertility levels down to desired levels – such as education and reduced mortality. One such determinant is GBV, defined as “acts that inflict physical… harm or suffering, threats of such acts, coercion and other deprivations of liberty” (UNGA, 1993).

2.3 Theoretical Frameworks

The study is based on one key theory, the Social-Ecological Model for Violence Prevention. This theory specifically addresses the importance of the multi-level factors of physical GBV, and one theory used to explain the relationship between fertility and the socio-demographic or indirect and proximate determinants – namely, Bongaarts’ Proximate Determinants Framework of Fertility. The theoretical underpinnings of Pathway Analysis (described in Chapter 3), was used together with the two theoretical frameworks to help conceptualise the conceptual framework used in his study.

Bongaarts’ framework specifically addresses the hypothesised relationship between indirect socio-demographic factors and direct RH outcomes, and how they affect fertility levels (Proximate Determinants Framework). However, neither Bongaarts’ original framework or Stover’s revised framework took cognisance of the multi-level contextual factors that may in fact be included as indirect socio-demographic factors, nor of physical Gender-Based Violence itself – and therefore the Social-Ecological Model for Violence Prevention is used for this purpose. Bongaarts’ framework also does not account for the indirect and direct effect of the pathway between the proximate and indirect determinants and fertility, for which the theoretical and graphical underpinnings of Pathway Analysis (see Chapter 3) is used for this purpose.

The two theoretical models (the Social-Ecological Model for Violence Prevention and Bongaart's Proximate Determinants Framework for fertility) are combined and modified to explore how such a relationship, between less and more severe physical GBV, with key socio-demographic and RH factors, could mediate the effect of fertility levels in Uganda. As such, the direct and indirect relationship that fertility has with the RH outcomes was founded on the ideas and assumptions of these theories together with the theoretical underpinnings of Pathway Analysis (see Chapter 3 for a full description).

Social-Ecological Model for Violence Prevention: Although the Social-Ecological Model was propounded by the WHO for the prevention of violence against women in general, its postulates can be used in research as well – and specifically for research that will inform programmes and policy for the prevention of physical GBV. The model was formulated by the WHO in 2002 to provide a holistic framework to be used for policies and programmes aimed at decreasing the incidence of all forms of violence. The WHO recognised that violence, including physical GBV, is a complex phenomenon in which the root causes are not simply explained at the individual level and that often there are many risk factors that may contribute to the increased or decreased levels of violence in a home or community. Therefore, the introduction of the ecological model was an attempt to better understand the multifaceted nature of violence but borrowed from a variety of psychological studies conducted in the 1970s on child abuse (WHO, 2002).

The model explains behaviour being influenced on four separate levels, factors that can either increase or decrease the incidence of violence. The first is the individual level, which are the personal factors that act upon individual behaviours – including different socio-demographic factors. Given that the ecological model was originally designed for psychological studies, individual level factors originally included in the model were also psychological in nature – such as certain psychological disorders. The second level, known as relationships or households, included any family or friends and the nature of those relationships between these peers and the victim or perpetrator. The third level include community-level (or contextual) factors (which could include schools, neighbourhoods, or any other nested level) that could contribute to the increased or decreased incidence of violence. The fourth level, which is not included in the present study due to limitations in the data, is the societal level – and mainly focuses on the policy environment and / or other social norms that extend throughout the whole population or society (WHO, 2012). What the model does not provide for is the actual factors to be included under each level, although minor examples of what could be included are provided in the final report. The exact relationships between the factors to be included in each of the overlapping levels (see Figure 2.1 below) is the role that research has, to better inform programmes and policies created to decrease the incidence of violence.

An ecological perspective is not only important in understanding violence; but understanding fertility levels as well. An ecological perspective shows that individual level, and other contextual factors, as well as their interaction have a bearing on the outcome (McLaren & Hawe, 2005). In fact, in 1985 Simmons wrote that it was necessary for fertility theories to now begin to consider household and community variables that may or may not influence fertility decisions (Simmons, 1985). Further, in reviewing the literature for this study, many studies found that fertility is often affected by contextual factors – not only at the individual level, but those found within household and communities in which the individuals live. An ecological perspective encompasses context which includes the physical, social, cultural, and historical aspects of context as well as the attributes and the behaviours of the people within that context. Key to an ecological analysis is the understanding that there is interdependence and interaction among the people and settings (McLaren & Hawe, 2005).

The model itself has been used predominantly for the conceptualisation of, and then the review of, programmes and interventions for violence prevention – and not necessarily GBV as defined in this study. Most of these have been funded or linked to CDC or other WHO-linked organisations (WHO, 2014b; CDC, 2015; Casey & Lindhorst, 2009). However, only one published study was found to have used the model as a theoretical basis to investigate the socio-ecological factors associated with intimate partner violence in Alaska, although the study was a systematic review of literature (Oetzel & Duran, 2004). Despite the scant availability of scientific studies that have used this framework, those that do exist in whichever form, have found that contextual determinants are not well understood nor investigated, but have an important bearing on the prevalence of violence of all forms in society.

Figure 2.1: Social-Ecological Model for Violence Prevention (WHO, 2002)

Proximate Determinants of Fertility Framework: There are numerous fertility theories that have been posited throughout the past few decades. Researchers have used these theoretical frameworks to explain the determinants and consequences of fertility in many countries around the world. Some of the fertility theories used include the demographic transition theory, theory of intergenerational wealth flows, economic theories of fertility (Hirschman, 1994; UN, 1990), ideational theory (Hirschman, 1994), as well as the proximate determinants of fertility framework (Bongaarts, 1978; Simmons, 1985) amongst others. According to Simmons (1985) "criteria for selecting the most appropriate (fertility) theory…are: (1) the predictive ability of the theory, (2) the reasonableness of the theory's assumptions, (3) the elegance and simplicity of the theory, and (4) the plausibility of the theory." It is, therefore, according to these criteria that fertility theories were reviewed, and then selected.

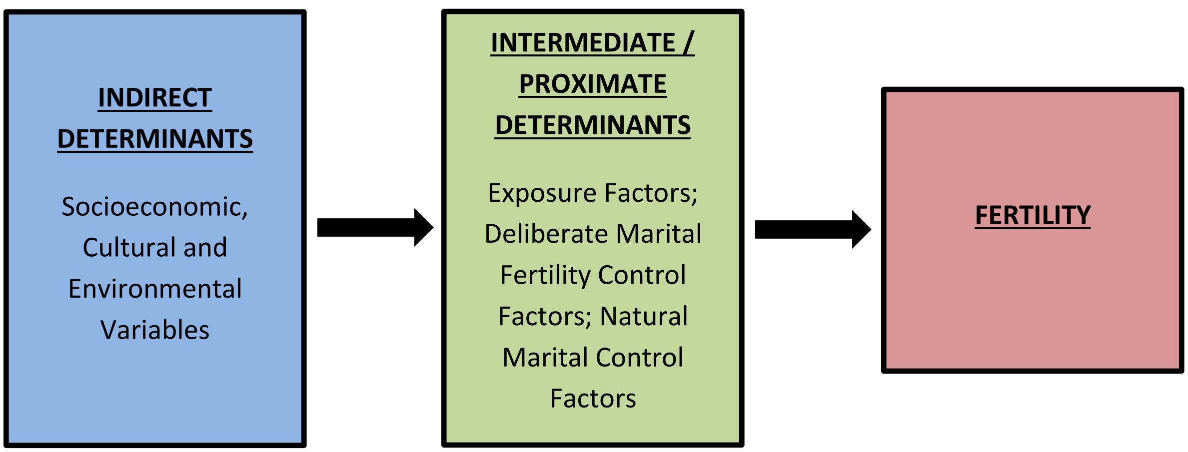
The demographic transition theory is perhaps the oldest theory explaining fertility changes, in which its key hypothesis (in terms of fertility) states that a country will move from a situation of high fertility to low fertility through a process of modernisation split into

3 key phases (Hirschman, 1994; UN, 1990). Although this theory was effective in explaining fertility changes in the westernised countries, it has failed to explain why some countries in sub-Saharan Africa have not reached the same level of fertility decline as the more developed countries even though high levels of modernisation have occurred and in other countries, fertility decline has occurred in the absence of such high modernisation levels (Hirschman, 1994). Furthermore, some studies have shown fertility rates to decline before mortality rates – whereas a key posit of the demographic transitions theory is that a decline in mortality rates precedes a decline in fertility rates (Simmons, 1985).

Furthermore, all the above-mentioned fertility theories suffered from providing a basis in which to look at both the socio-economic factors that influence fertility as well as the mechanisms in which these factors work. However, each theory provided some important aspects to consider in the conceptualisation of the framework used in this study. These aspects, together with the main theoretical frameworks and the pertinent literature reviewed, are used to develop the model and are included in the final selection of factors in the study. The conceptual framework for fertility used for this study, is Bongaarts' Proximate Determinants of Fertility framework.

Substantial insights into fertility, fertility levels and differentials can be investigated if the frameworks within which the research works looks both at the socio-economic factors that influence fertility as well as the mechanisms in which these factors work are considered (Bongaarts, 1978; Bongaarts, 2015). Bongaarts (1978; 2015) names the biological and behavioural factors through which socioeconomic, cultural and environmental variables that could affect fertility the "intermediate fertility variables" (Bongaarts, 1978; Bongaarts, Frank & Lesthaeghe, 1984; Bongaarts, 2015) – or the direct determinants. According to Bongaarts (1978) "The primary characteristic of an intermediate fertility variable is its direct influence on fertility. If an intermediate variable …. changes, then fertility necessarily changes also… Consequently, fertility differences among populations and trends in fertility over time can always be traced to variations in one or more of the intermediate fertility variables". The proximate determinants include exposure, deliberate marital fertility control, and natural marital control factors. Schematically, Bongaarts show the conceptual relationship as depicted in figure 2.2.

Figure 2.2: The Relationship between Fertility Differentials and the Intermediate Fertility Variables



Bongaarts' original model, which was formulated in 1978 and then revised in 2015, only included a handful of intermediate fertility variables, and were by no means seen to be a comprehensive list (Bongaarts, 1978; Bongaarts, 2015), but from which he derived from the Davis and Blake Model introduced in 1956 (Davis & Blake, 1956; UN, 1990). In Bongaarts' model, 11 intermediate fertility variables are captured within eight factors groups under three broad categories, namely exposure factors, deliberate marital fertility control factors, and natural marital control factors.

Together these three broad categories included 11 variables, originally proposed by Davis and Blake, and include:

1. Exposure factors - Proportion married
2. Deliberate marital fertility control factors – Contraception and induced abortion
3. Natural marital fertility factors - Lactational infecundability, frequency of intercourse, sterility, spontaneous intrauterine mortality (or miscarriages), and duration of the fertile period

However, Bongaart's calculates the TFR based on a multiplicative equation of the proximate determinants, each treated as a factor that inhibits fertility:

$$TFR = C_m C_c C_i C_\alpha TF$$

Where: TFR = Total Fertility Rate, C_m = marriage index; C_c = contraception index; C_i = post-partum infecundability index, C_α = abortion index; *TF* = Total Fecundity rate

The earlier version, however, saw marriage as an exposure to fertility – which studies found was not necessarily the case. In 2015, however, Bongaarts' revisited his model and reviewed both his original model of 1978 as well as the revised model proposed by Stover in 1998 – conceptually, the model remained the same and was found to still be of relevance. The changes or "fine-tuning" that Bongaarts made to the model was that the aggregate model was derived from the age-specific model to provide more accuracy to estimate the impact of the proximate (or indirect) determinants. Marriage was replaced with marital/union/sexual exposure, given new evidence that in many contexts marriage was no longer necessarily a predictor of fertility. Another revision, proposed by Stover, was that often there is an overlap between infecundability and contraceptive use, and there were slight revisions in the calculation of the abortion rate (Bongaarts, 1978; Bongaarts, 2015).

The model can be used in three ways. The first of these is for comparative fertility analyses to determine the intermediate fertility variables responsible for fertility differences amongst populations or between sub-groups in a population. A second way the model can be used is that it can trace a change in the fertility level of a population to changes in the intermediate fertility variables. Finally, the model can be used to project future fertility trends – estimating how much one or a combination of several of the intermediate fertility variables would have to be modified for a change in fertility to occur (Bongaarts, 1978). Other authors agree that the most informative studies are those that attempt to trace social change on fertility through proximate determinants, but that an important element of an improved analytical framework is a clear specification of hypothesised impacts of independent variables on both fertility and family planning behaviour (Bulatao & Casterline, 2001). It is this latter way in which Bongaart's theory contributes to this study.

2.3.1 The Relevance of the Theoretical Frameworks to the Study

For this study, it is hypothesised that the exposure factors stipulated in the Bongaarts' model (in this case, unintended pregnancy, contraceptive use, and abortions / miscarriages and which are subsequently known as the RH outcomes) affect fertility levels in Uganda. However, Bongaarts' model also allows for the inclusion of the socio-demographic factors that are found to affect these outcomes as indirect factors. The Proximate Determinants framework, however, did not specifically include severity of physical GBV, nor did it include the provision of contextual factors, for analysis and interpretation. Therefore, the Social-Ecological Model for Violence Prevention allows for both the inclusion of less and more severe physical GBV as well as the three levels (individual, relationship and community) of indirect factors. In combination, the two theoretical models therefore provide the groundwork for this study's conceptual framework.

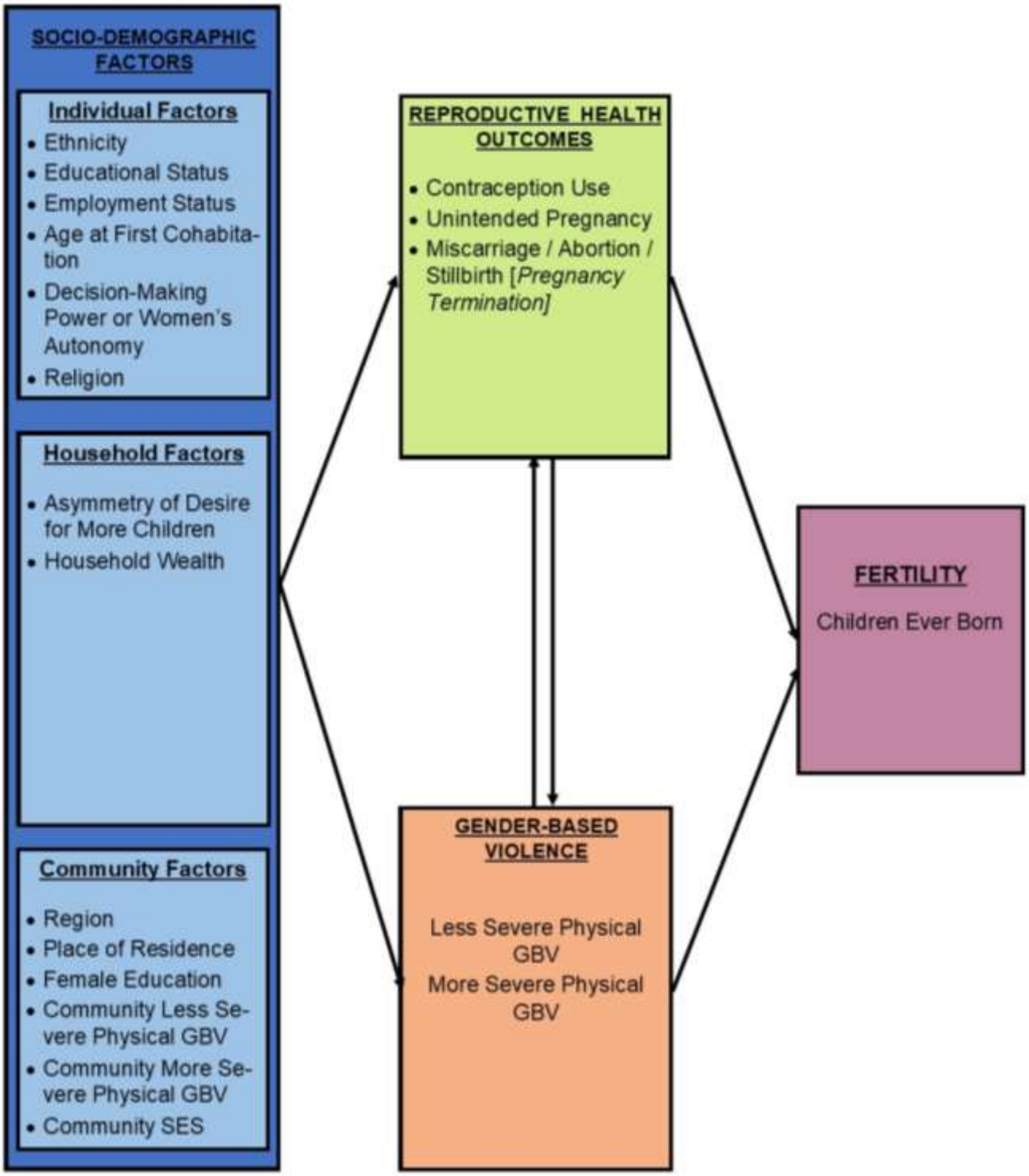
2.4 Conceptual and Operational Framework

This study uses the relationship between the socio-demographic factors (indirect) and proximate or intermediate RH outcomes (direct) as depicted by the Proximate Determinants of Fertility framework, and its effect on fertility levels. This is used to show the hypothetical relationship between socio-demographic variables (indirect factors) on RH outcomes (direct variables). These direct variables subsequently have a direct relationship on whether fertility levels are high or low in Uganda. Understood in this way, we can see that the individual is more than simply a unit of measurement, and that an individual's experience of less and more severe physical GBV and their fertility behaviour is better understood when studying an individual as part of their relationship and community. Individual behaviour, and the outcomes of that behaviour, is more holistically understood and studied with the acknowledgement that individuals are also part of contexts or systems that influence that behaviour and their decisions – and therefore, the outcomes of those behaviours and decisions.

Thus, the conceptual framework for this study brings together the two theoretical frameworks discussed above, namely the Proximate Determinants of Fertility Framework and the Social-Ecological Model for Violence Prevention - and adapts them accordingly. The postulate is that the indirect determinants of fertility do not only occur at the individual level but are influenced by factors in the relationship between the victim and their partners as well as factors inherent in their community. There are, therefore, individual, relationship and community level indirect determinants that ultimately influence the health behaviour and fertility of the individual.

One addition made for this study, is the hypothesis that physical GBV does not act uni-directionally on the RH outcomes but may in fact act both directly and indirectly to influence the increase or decrease of RH outcomes – which affects the levels of fertility. Therefore, fertility is directly affected by the direct determinants and fertility (the RH outcomes), but the direct determinants are dependent on both the indirect determinants (at the individual, relationship and community levels) and on physical GBV. Further, the level of GBV is hypothesised to affect the direct determinants and, in turn, influence fertility. Figure 2.3 below shows the adapted framework for this study.

Figure 2.3: Ecological Operational Framework of RH, physical GBV and Fertility (*adapted from the Bongaarts' Proximate Determinants of Fertility Framework and the Social-Ecological Model for Violence Prevention*)



2.5 Research Hypotheses

1. Higher levels of physical GBV are associated with a higher number of children ever born through higher levels of unplanned pregnancies and levels of having had a pregnancy terminated; but lower levels of contraceptive use (RH Outcomes).
2. More educated women have a lower prevalence of physical GBV and therefore a higher use of contraceptive use, and therefore a lower number of children ever born
3. Prevalence of physical GBV increases with younger age at first cohabitation due to a lower level of women's empowerment (household decision-making used as a proxy for women's empowerment)
4. Women living in rural areas have a higher prevalence of physical GBV, and therefore lower levels of contraceptive use leading to higher number of children ever born.
5. Women living in communities with high levels of women with secondary or higher education have lower prevalence of physical GBV, higher contraceptive use and therefore lower number of children ever born
6. A higher prevalence of physical GBV leads to a higher number of children ever born, both directly and indirectly

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The first sub-section in this chapter outlines the study setting, the design of the Demographic and Health Survey, and describes the population and the sample used for the study. This is then followed by a description of the instruments used for data collection. A description of the outcome variable, as well as the individual, relationship and community variables and the RH and GBV variables used in the analysis then follows. After which, the next section explains how the analysis answers the objectives of the study, preceded by how the data was assessed. This chapter ends with a short explanation of ethical issues as well the dissemination strategy of the study's findings.

3.2 Study Setting

Uganda is a land-locked country in the eastern part of Africa, neighbouring Kenya, South Sudan, the Democratic Republic of Congo, Rwanda, and Tanzania. Its capital city is Kampala. A large portion of the southern part of the country borders with Lake Victoria, which is one of the world's biggest lakes. Uganda has a land area of 241 039 square kilometres with 112 administrative districts; and as of 2014 had a population of 34.9 million people (see Figure 3.1). Uganda currently has one of the highest population growths and fertility rates in the world, and these trends are expected to continue given its extremely young population (UBOS & ICF, 2007; UBOS & ICF, 2012).

Uganda has five major ethnic groups; namely Baganda, Banyankole, Basoga, Bakiga, and Itesa. Although the primary national language is English, the second lingua franca in the country is Swahili. Most of the population (85%) is Christian, with around 40% being catholic and 35% belonging to the Anglican Church of Uganda. However, the Iganga District in the eastern part of the country has a high number of Muslims, which constitute around 12% of the population (Wikipedia, 2013).

Uganda's first elections were held on the 1st of March 1961, obtaining independence from Britain and officially becoming a republic in 1963. However, in 1971, Uganda experienced a military coup by Idi Amin. Idi Amin dissolved parliament, staged mass ethnic and human rights violations until he was forced out of Uganda into Libya in 1979 by the Tanzanian army. The president which followed, President Milton Obote also recorded some of the worst human rights violations in history and ran the country until 1985, until the army proclaimed a military government, forcing Obote to flee to Zambia. Since this time, armed resistance against the government has continued in the northern parts of the country (UBOS & ICF, 2012; Wikipedia, 2018). General Tito Okello only ruled for 6 months until 29th January 1986, when President Yoweri Museveni proclaimed the presidency under the political group of the National Resistance Movement or NRM. The NRM has been effective in ending human rights violations and increase political liberalisation and freedom of press – which was absent in the previous two regimes. Broad economic reforms, with the aid of the World Bank and IMF, were also instituted during their rule. However, in August 2005, parliament passed a referendum that allowed presidents to run for multiple terms and increasing the age limit for a president. Therefore, allowing Museveni to run for a 3rd term. Museveni won the 2006 elections and is currently still the President of Uganda (Wikipedia, 2018).

Uganda is an agricultural based economy, with coffee remaining its greatest export. During the 1960s Uganda experienced positive economic growth, but this deteriorated dramatically in the 1970s and 1980s with the political unrest. Since the mid-1980s GDP growth has improved somewhat to levels ranging between 5.6% and 7.1% between 2006 and 2011, due to several programmes instituted by the government (UBOS & ICF, 2012; Wikipedia, 2013). In general, living conditions in Uganda are said to be poor, and the country is in fact one of the poorest in the world. Furthermore, the fertility rate is one of the highest in the world (TFR of 6.2 in the 2011 UDHS and 5.4 in the 2016 UDHS). Women living in rural areas have almost twice as many children as those living in urban areas, and almost a quarter of all women have at least 1 child by the age of 15 to 19 years (UBOS & ICF, 2012).

Figure 3.1: Map of Uganda

Source: www.ezilon.com (2015)

3.3 Study Design

This study used a secondary data source, namely the 2011 Demographic and Health Survey (UDHS). The UDHS is a nationally representative cross-sectional survey and follows from DHS conducted in Uganda in 1988/89, 1995, 2000-01, and 2006. The 2011 UDHS was, therefore, the 5th DHS survey to be conducted in the country.

In general, data from the DHS are comparable across countries, and is collected in over 85 developing countries, including those in sub-Saharan Africa. For some countries, multiple DHS data are available for different years, making it possible to study trends in those countries over time. These surveys include many indicators on population, health and nutrition; and cover a broad array of topics including (but not limited to) family planning, fertility and fertility preferences, unmet need, and women's empowerment. Furthermore, the DHS includes a Gender-Based Violence module for several sub-Saharan African countries, namely Burkina Faso, Cote D'Ivoire, Ghana, Liberia, Mali, Nigeria, Kenya, Malawi, Rwanda, Tanzania, Zambia, Zimbabwe, Cameroon, Democratic Republic of Congo, Sao Tome and Principe, South Africa, and Uganda. However, as this study investigated the pathways between GBV and fertility, Uganda, which has both a high fertility rate and high rates of GBV, was selected for analysis.

The UDHS was conducted by the Uganda Bureau of Statistics (UBOS), with two-stage cluster sampling design. The sampling frame used was from the 2002 Ugandan Population and Housing Census together with an electronic file that consisted of close to 50 000 Enumeration Areas. Enumeration areas assured geographic and regional variation, and data was further collected for urban and rural areas separately. A two-stage sampling strategy was used, firstly 404 EAs were selected from a list of clusters from the 2009/10 Ugandan National Household Survey (UNHS) to link health and poverty data. Households within each cluster were purposively selected from a list of households, providing a sample of 10 086 household (UBOS & ICF, 2012).

3.4 Population and Sample

The sample for the 2011 UDHS was designed to provide population and health indicators at the national and subnational levels. The sampling frame used for the 2011 UDHS was selected using a two-stage process. The first stage selected 404 enumeration areas selected from a list of clusters that had been compiled for the 2009/10 National Household Survey. At the second stage, households within each cluster were purposively selected from a complete list of households – all households within the 404 enumeration areas were included in the 2011 UDHS. A representative sample of 10 086 households were included in the 2011 UDHS, and all women of reproductive age (15 to 49 years) who were permanent residents or visitors who slept in the household the night before were interviewed and included in the final dataset (UBOS & ICF, 2012). Adult women of reproductive ages (15-49) that were included in the Gender-Based Violence module, were included in this study. Therefore, demographic and socio-economic indicators included in this study were for all women represented in the Gender-Based Violence module of the Uganda 2011 DHS survey.

3.5 Instruments

In general, DHS surveys included three types of core questionnaires – the household, men, and women's (or individual) questionnaires. The household questionnaire collected information on everyone in the household, including their age, sex, relationship to the household head, and education. Information on the household characteristics (sanitation, water, etc.) as well as information on nutritional status and anaemia was also collected with the household questionnaire. Men and women identified during the household questionnaire were then invited to partake in the men's and women's questionnaire respectively. The women's questionnaire collected information on the women's background characteristics; reproductive behaviour and intentions; contraception; antenatal, delivery and postpartum care; breastfeeding and nutrition; children's health; the status of the women; AIDS and other sexually transmitted infection; the husband's characteristics, as well as information on environmental health and tobacco use. On the other hand, the men's questionnaire collected information on the man's background information; reproduction; knowledge and use of contraception; employment and gender roles; AIDS and other STIs; as well as other health issues such as circumcision, use of tobacco and TB. Over and above the three core types of surveys conducted at each DHS, a few optional modules were available for inclusion into the core questionnaire. These optional modules included questions on Gender-Based Violence, female genital cutting, maternal mortality, fistula, and out-of-pocket health expenditures (UBOS & ICF, 2012).

Specifically, in the 2011 UDHS four questionnaires were used. They were the Household Questionnaire, the Women's Questionnaire, Maternal Mortality Questionnaire, and the Men's Questionnaire. These questionnaires were adapted to reflect the population and health issues relevant to Uganda at a series of meetings with various stakeholders from government ministries and agencies, non-governmental organisations, and international donors. In addition to English, the questionnaires were translated into seven major Ugandan languages: Ateso, Ngakarimojong, Luganda, Lugbara, Luo, Runyankole-Rukiga, and Runyoro-Rutoro (UBOS & ICF, 2012).

In the UDHS the Household Questionnaire was used to list all the usual members and visitors of selected households. Some basic information was collected on the characteristics of each person listed, including his or her age, sex, education, and relationship to the head of the household. For children under age 18, survival status of the parents was determined. The data on age and sex obtained in the Household Questionnaire were used to identify women and men who were eligible for an individual interview. Additionally, the Household Questionnaire collected information on characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor of the house, ownership of various durable goods, and ownership and use of mosquito nets (to assess the coverage of malaria prevention programmes). The Woman's Questionnaire was used to collect information from all women age 15-49.

For the purposes of this study, to extract all required variables, the individual recodes (women's questionnaire), household recode (household questionnaire), and male recode datasets were merged. Therefore, the study was a cross-sectional study that used secondary datasets from the Ugandan Demographic and Health Survey (UDHS). UDHS

1989, 1995, 200, 2006 and 2011 were used to assess the levels and trends in fertility in Uganda throughout this period (objective 1); whilst UDHS 2011 was used to describe respondent characteristics, as well as answer objectives 2 and 3.

3.6 Variables Identification

3.6.1 Dependent Variable

The outcome analysed in this study was fertility. The outcome variable was selected to assess lifetime or past fertility, known for the purposes of this study as Children Ever Born (CEB), given that the study sought to find the association and relationship between ever experience of GBV and fertility. Therefore, fertility measures such as ASFRs and TFRs, which measure current fertility would not have provided an accurate association. TFRs provide the total number of children a woman would bear during her lifetime, but only if she were to experience the prevailing age-specific fertility rates of women. On the other hand, ASFR is the number of live births per 1000 women in a specific age group in one calendar year. The TFR equals the sum for all age groups of 5, times each ASFR rate.

CEB, on the other hand, is a cumulative measure. The CEB is easily calculated from census or survey data which ask women how many children she has borne. CEB is used primarily for retrospective comparisons. It does not include any control for age or for cohort differences in fertility. CEB is not a good measure of overall fertility if fertility has changed considerably over time, which is not the case in Uganda where fertility has remained high and decreased slowly in the last few decades. The CEB, if calculated for women at the end of their reproductive years (15 to 49 years), is called the ‘completed fertility rate’ or “achieved fertility”. The use of such a cumulative measure has been used in previous fertility studies of Uganda, such as in Bbaale and Mpuga’s 2011 study; as well as in other fertility studies by Odimegwu and Colleagues (2015), Lam and Duryea (1999) and Ainsworth and colleagues (1996) given that it provides insights into long-term fertility behaviour (Bbaale & Mpuga; 2011).

In the DHS, CEB information was collected from all women of reproductive age, by asking and adding the answers to, the following questions:

1. How many sons and daughters live with you?
2. How many sons and daughters are alive but do not live with you?
3. How many boys and girls have died?

CEB is the dependant variable of the study. However, for descriptive analyses the Total Fertility Rates (TFR), mean CEB and mean achieved fertility were also shown. The mean CEB and mean achieved fertility are simply the average number of children ever born for women in Uganda and for those who are at the end of their reproductive cycle, respectively. These were shown to provide a comprehensive overview of the fertility landscape in Uganda. The TFR is a hypothetical measure that shows the number of children a woman would bear if she bore children according to the current age-specific fertility rates (ASFRs) (Mboup & Saha, 1998). Mean CEB, mean achieved fertility and TFR were used for the descriptive statistics and analyses, whilst CEB was used for all subsequent analyses.

3.6.2 Moderator Variable

The moderator factor of interest in this study was severity of physical GBV (less or more severe). The variables for GBV come from a special module that is added onto the standard DHS questionnaire, and is known as the Domestic Violence module. This module contains several questions related to the topic of Gender-Based, or Domestic, Violence. For this module, information was collected on violence experienced by the women by her partner (as well as anyone else) since her 15th birthday. Questions were asked about physical, sexual and emotional abuse experienced; although physical GBV was separated into less severe and more severe physical GBV.

Given that the consequences of less and more severe physical GBV differ, for the purposes of this study these variables remained as is to assess whether the factors that contribute to their prevalence differ as well. Physical GBV has been shown to lead to low contraceptive rates (Pallitto & O'Campo, 2004; Pallitto & O'Campo, 2005a; Pallitto & O'Campo, 2005b) and less likelihood of women seeking medical care (Adedini, Odimegwu, Bamiwuye, Fadeyibi & Wet, 2014). However, previous studies have not investigated what the pathways of this relationship are, the effect that these have on fertility amongst Ugandan women, and whether severity of physical GBV affects RH outcomes differently.

In the DHS, the variables for less and more severe physical GBV are calculated using the answers to the following questions:

1. **More Severe Physical GBV**: whether a woman had ever been kicked / dragged, strangled / burned, or threatened with knife / gun / another weapon.

2. **Less Severe Physical GBV**: whether a woman had ever been pushed, shaken, or had something thrown at them; slapped; punched; twisted / hair pulled by husband / partner

If the woman had never experienced less or more severe physical GBV the response was coded as No (0), whilst those who had ever experienced less or more severe physical GBV were coded as Yes (1).

3.6.3 Independent Variables

The analysis included several independent variables, or otherwise known in this study as the indirect factors. The variables were derived from past literature that was reviewed, as well as from variables that the framework hypothesised could have an impact on fertility and GBV. These factors were selected on the basis that they have been found to affect both fertility levels as well as the experience of physical GBV in other contexts (see Chapter 2).

Furthermore, three levels of independent variables (or indirect factors) were obtained from the DHS questionnaires. Individual, Household and Community level variables were used in the analysis, as presented in the conceptual framework. The tables that follow (Tables 3.1, 3.2, and 3.3) show the explanatory variables that were used in the analysis, as well as the way they were coded. The tables are separated into the three levels of factors used in the multilevel models. However, for the path analysis household and community level variables were used as individual level variables.

The individual level variables included socio-demographic characteristics of the women interviewed in the DHS (Table 3.1). These variables were chosen based on what was found in the literature, as well as their relevance to this study and those concerning both GBV and fertility outcomes. These include ethnicity, highest educational level, employment status, religion, age at first cohabitation, and women's decision-making autonomy.

Ethnic and religious affiliation has been found to impact on fertility levels in Nigeria (Avong, 2001); as well as levels of GBV in a multi-country study (Field & Caetano, 2004). Certain ethnic groups and religions are proponents of higher number of children, and therefore encourage higher fertility levels. However, it is not quite clear how ethnicity and religion affect GBV in Uganda, given that in some countries certain religious and ethnic groups were found to have higher levels of GBV whilst amongst other they were lower.

Education is probably one of the most well-known socio-demographic factors shown to influence fertility levels. The actual way in which education works to depress fertility has been researched and debated extensively, but one of the main reasons is that author's believe that higher educational attainment increases women's status and autonomy (Hondroyiannis, 2010; Bongaarts, 2010; Drèze & Murthi, 2001; Cochrane, 1979; Tavares, 2010; Fielding & Torres, 2009; Caldwell, 1980; Cochrane, 1983; Martin, 1995; Rindfuss Bumpass & St. John, 1980; Kravdal & Rindfuss, 2008; Becker, Cinnirella & Woessmann, 2010; Diamond, Newby & Varle, 1999; Martin & Juarez, 1995; Basu, 2002). However, though many believe that education's effect on women's status and autonomy could decrease the levels of GBV experienced by these women, the relationship between education and GBV remains unclear – in some contexts more educated women are less likely to experience GBV (Vakili, Nadrian, Fathipoor, Boniadi & Morowatisharifabad, 2010; Vyas & Watts, 2009; McCloskey, Williams & Larson, 2005), whilst in others they are more likely (Gage, 2005). Therefore, these relationships warrant further investigation.

Employment status shows a similar relationship with fertility and GBV as education does. Female employment has a positive effect in decreasing fertility levels (Allman, 1978; Handwerker, 1991; Johnson, Abderrahim & Rutstein, 2011; Kalipeni, 1995; Kane & Ruzicka, 1996; Martin, 1995; Mostert & Hofmeyr, 1988). However, although in America it has been found that employed women experience less GBV than those who are unemployed (Cunradi, Caetano & Schafer, 2002), this relationship is not consistent as Bauer and colleagues (2000) found no difference between those who are and who are not employed.

Women's decision-making autonomy or women's involvement in household decisions (as a proxy for women's empowerment) have been proposed by numerous authors to decrease fertility levels, given that these women are able to negotiate their fertility preferences and behaviours (Bongaarts, 2010; Klasen & Launov, 2006; Kalipeni, 1995; Handwerker, 1991; Martin, 1995; Kulkarni, Krishnamoorthy & Audinarayana, 2013; Abadian, 1996; Upadhyay & Karasek, 2010). In some studies, it has been found that women who go out without the husband's consent experience higher levels of violence (Uthman, Lawoko & Moradi, 2009; Hindin & Adair, 2002), whilst in developed countries it has also been found that men who control their wives often exhibit fertility promoting behaviours which could lead to violence if contrary to the desires of the spouse (Moore, Frohwirth & Miller, 2010). Furthermore, one study has found that young age at first cohabitation decreases the likelihood that women will be educated, and therefore employed and / or exhibit decision-making autonomy which increases fertility (Sibanda, Woubalem, Hogan & Lindstrom, 2003). However, this study also hypothesises, given that these factors also exhibit relationships that could increase GBV in other studies mentioned above, it should also be considered in an investigation of GBV. Furthermore, it is also known that women in Uganda cohabit and bear children, on average, at extremely young ages. Therefore, for this reason, age at first-cohabitation has also been included as an individual level socio-demographic factor.

Table 3.1: Individual Variables

Name of Variable	Definition of Variable
1. Ethnicity	Muganda (1) Munyankole (2), Musoga (3), Mukiga (4), Ateso (5), Other (6)
2. Highest educational level	None (0), Primary (1), Secondary (2), Higher than secondary (3)
3. Employment status	Not Employed (0), Employed (1)
4. Religion	Catholic (1), Protestant (2), Muslim (3), Pentecostal (4), SDA (5)
5. Age at First Cohabitation	Below age 15 (1), 15-19 (2), 20-24 (3), 25 years and above (4)
6. Women's Decision-Making Autonomy	Wife involved in Decision Making (either solely or partially) (1), Wife not involved in Decision-Making at all (2) *Created using a composite index of 3 variables derived from the UDHS – women involved in decision-making for (a) visiting friends and family (b) large household purchases (c) decisions on own (woman's) health care. Women involved in any of these decisions were coded as 1, women involved in none of these decisions were coded as 2.*

The household variables included two variables that related to key features in the husband/wife or household dynamic that were found in the literature to influence GBV incidence and fertility levels separately. These included the household wealth and the asymmetry between the wife's and husband's desired number of children (Table 3.2).

Household wealth or socio-economic status (SES) has been found to be one of the variables that explain variations in fertility levels between household and regions. In general, those with low household wealth or SES, show higher levels of fertility (Kalipeni, 1995; Mostert & Hofmeyr, 1988). However, it is inconclusive whether increased or decreased household wealth would impact on the experience of GBV, in the same way that results from studies are inconclusive whether educational status and employment status increase or decrease GBV. In a study conducted by Bauer and colleagues (2000) those who came from higher and lower wealth households had no difference in the prevalence of GBV; whilst in the United States, Cunradi and colleagues (2002) found that women from higher income households had lower prevalence of GBV.

In Nigeria, it has been found that very often spouses desired number of children do not equate, and at times with very little agreement regarding future fertility (Mott & Mott, 1985). Ntozi and Odwee (1995) found that in Uganda men often desired more children than women, and therefore the desired number of children between husband and wife in these cases were asymmetrical. It is not known if, or how, this could affect the occurrence of GBV in the home, and whether this would therefore increase fertility towards the male's desired number of children. As such, asymmetry of desired number of children has been included as a household socio-demographic factor.

Table 3.2: Household Variables

Name of Variable	Definition of Variable
1. Asymmetry of Desired Number of Children	Both want same (0), Husband wants more (1), Husband wants less (2), Don't know (8)
2. Household Wealth Status	Poor (1), Middle (2), Rich (3)

Community variables increase our understanding of the context in which the individual and households reside, and which often have a bearing on whether individuals have access to certain services and social norms that may or may not affect fertility rates, and/or prevalence of GBV. Community variables included in this study were selected in accordance to what was found in the literature, as well as relevant socio-demographic community variables; namely the region of residence in each country, the type of place or residence of the area, and community maternal level of education, community level of education, and community level of less and more severe physical GBV (Table 3.3).

Some of the community variables are individual responses that were aggregated by region to show proportions for those regions, using specific geographical locations for the purposes of multi-level modelling. These specifically related to the community-level variables for female education, wealth status and (less and more) severe physical GBV. These variables were defined as the proportion of women falling within a wealth quintile of rich or richer, an educational status of secondary or post-secondary, and the proportion of women having experienced less or severe physical GBV. Each measure was then divided into three quintiles (low, medium and high). Region and place of residence were also included as community-level variables but were not aggregated.

Both fertility levels and prevalence of GBV have been found to differ by region in different countries in Africa, as well as by urban and rural areas, in many studies (Kalipeni, 1995; WHO, 2013). This information is crucial for policy-makers and programme personnel, so that decisions can be made regarding where financial and human resources need to be allocated. Africa also shows variation amongst urban and rural areas – rural areas often have both higher levels of fertility (Allman, 1978; Handwerker, 1991; Johnson, Abderrahim & Rutstein, 2011; Kalipeni, 1995; Kane & Ruzicka, 1996; Martin, 1995; Mostert & Hofmeyr, 1988; Machiyama, 2010; Bbaale & Mpuga, 2011), as well as GBV (Uthman, Lawoko & Moradi, 2009).

The effect of maternal education on fertility is known, although the pathways and reasons why education influences fertility are not completely understood. Some studies have shown that it may not necessarily be only the effect of education itself, but the socialisation of women in general who live in communities with high levels of maternal education (UN, 1990; Lloyd, Kaufman & Hewett, 2000; Dzegede, 1981). Similarly, one study found that women living in communities with high levels of educated females also had lower prevalence of GBV (Gage, 2005).

Community level of wealth has been found to depress fertility rates, although no research has been done on whether this may have the same effect on GBV – as with communities with high levels of educated females (Dzegede, 1981; Kravdal, 2002). However, given that the effect of household wealth on GBV has been found to have an influence in decreasing the prevalence of GBV, it is worth including this variable in the analysis of a study looking at the influence of GBV on fertility rates. On the other hand, there are studies that have found that communities with high levels of GBV perpetuate high prevalence of individual level GBV (Gage 2005; Koenig, Stephenson, Ahmed, Jejeebhoy & Campbell, 2006), and therefore, should be included as a community level factor in this study which attempts to investigate the relationship between GBV and fertility – given that this may be an indirect factor that contributes to the individual level prevalence of GBV, and hence increasing fertility.

Table 3.3: Community Variables

Name of Variable	Definition of Variable
1. Region of residence	Kampala (1), Central 1 (2), Central 2 (3), East Central (4), Eastern (5), North (6), Karamoja (7), West Nile (8), Western (9), Southwest (1)
2. Type of place of residence	Urban (1), Rural (2)

3.	Community maternal level of education – proportion of women with at least secondary education	Low (1), Medium (2), High (3)
4.	Community level of wealth status	Low (1), Medium (2), High (3)
5.	Community Level of Less Severe Physical GBV	Low (1), Medium (2), High (3)
6.	Community Level of More Severe Physical GBV	Low (1), Medium (2), High (3)

3.6.4 RH Outcome Variables

Table 3.4 below shows the proximate or direct determinants (in this study, these are otherwise known as the RH outcomes), as shown in the conceptual framework. The selected determinants are current use of contraception, unintended pregnancy/planning status of recent pregnancy, and ever had a pregnancy terminated. These RH outcomes were selected as they are proximate determinants included in Bongaart's framework, but which also have been proven to have a direct effect on fertility rates; as well as impact and be impacted on by GBV on women.

Regarding contraceptive use, it is not necessarily the use of any form of contraception that has been found to depress fertility rates, but the use of modern contraception. As such, whether a woman is using modern contraception is important, as the effectiveness of traditional methods has not shown the same relationship consistently (Johnson, Abderrahim & Rutstein, 2011; Ainsworth, 1996; Thomas & Maluccio, 1996; Ijaiya, Raheem, Olatinwo, Ijaiya & Ijaiya, 2009; Bongaarts, 2010; Sibanda., Woubalem, Hogan & Lindstrom, 2003; Dzegede, 1981). On the other hand, GBV has been found to affect women's ability to access and take contraception but women have also been known to be abused because they are found to be taking contraception by their spouses or partners (Pallitto & O'Campo, 2004; Pallitto & O'Campo, 2005b; Pallitto & O'Campo, 2005a; Gee, Mitra, Wan, Chavkin & Long, 2002; Okenwa, Lawoko & Jansson, 2011; WHO, 2013).

Abortion is illegal in Uganda. Despite the illegality of this, abortion is still known to be used as a fertility control measure when other means of fertility control have failed (Gorrette, Nabukera & Salihu, 2006; Mirembe, 1996). However, women who experience GBV have also been found to have higher numbers of both abortions and miscarriages – although the direction of the relationship is unknown (Pallitto & O'Campo, 2004; Pallitto & O'Campo, 2005b; Pallitto & O'Campo, 2005a; Gee, Mitra, Wan, Chavkin & Long, 2002). The variable in the DHS is termination of pregnancy, and include abortions, stillbirths and miscarriages together due to the illegal nature of abortions in the country. However, it could still provide some insight into the relationship between GBV and abortions / miscarriages, and thus on fertility.

Finally, unintended or mistimed pregnancies are another reproductive health outcome known to increase fertility levels (Bongaarts, 2010; Johnson, Abderrahim & Rutstein, 2011; Rafalitnanana & Westoff, 2000), but also to occur within abusive relationships (Pallitto & O'Campo, 2004; Pallitto & O'Campo, 2005b; Pallitto & O'Campo, 2005a; Okenwa, Lawoko & Jansson, 2011; Kaye, Mirembe, Bantebya Johansson & Ekstrom, 2006; WHO, 2013) and therefore, the relationship between this reproductive outcome and how its moderated by GBV to affect fertility requires further investigation.

Table 3.4: Reproductive Outcome Variables

Name of Variable	Definition of Variable
1. Current use of contraception	No method (1), Traditional method (2), Modern method (3)
2. Unintended pregnancy/Planning status of recent pregnancy	Pregnancy not planned (0), Pregnancy planned (1)
3. Ever had a pregnancy terminated (stillbirth, miscarriage, abortion)	No (0), Yes (1)

3.7 Data Assessment

The women's (or individual) recode was merged with the household and men's recode to ensure that all relevant variables for the study's analysis were included. Prior to beginning with the data analysis, the merged dataset was thoroughly reviewed, and the variables selected for the study were included, and where necessary, computed. To ensure that all data was cleaned and checked before analysis to ensure that it was the complete, consistent and accurate. Frequencies and cross-tabulations were conducted to verify sample size and locate invalid and/ or outlier values. The other method used for checking the accuracy of the data in this study was by examining the minimum and maximum values of numeric variables. The inclusion criteria for this study was women of reproductive age (15 to 49 years) who had been included in the domestic violence module of the 2011 UDHS. Women below or above these ages, and those not included in the domestic violence module were dropped from the data set and therefore not included the subsequent analyses. In addition, fertility estimates obtained through the indirect estimation techniques in Chapter 4 confirmed that the fertility data was a reliable quality.

Multicollinearity between variables was checked to assure that variables included in the study were not highly correlated to one another. Multicollinearity between the independent variables and the RH outcomes was checked were done using Variance Inflation Factor (VIF) was used to detect whether any of the variables were correlated, if a variable has a VIF value of 10 or a tolerance level (1/VIF) of 0.1 or lower, then the variable was removed from the analysis. This was done using the *vif* command in Stats version 14. Furthermore, model specification was verified using *linktest* – where the variable of prediction was significant, but the variable of prediction squared was not, the model was found to be without specification errors (UCLA IDRE, 2017a). Finally, the post-estimation command to test the fit of the model, *estat gof*, was selected. Where the goodness of fit statistics was not significant, it was concluded that the data fit the model reasonably well (UCLA IDRE, 2017b).

3.8 Methods of Data Analysis

Prior to answering the objectives, the characteristics of the respondents based on the socio-demographic factors, severity of physical GBV as well as the Reproductive Health outcomes of Ugandan women of reproductive age were described (results in Chapter 4). The univariate analysis was presented in the form of frequency tables, together with their relative frequencies and percentage distributions, and with the use of figures. Thereafter, this section provides the percentage distributions of Ugandan women who experienced less and more severe physical GBV, as well as those who experienced either less or more severe physical GBV and those that experienced both severities of physical GBV.

The methodologies employed for the data analysis are described under each objective below. Univariate analysis conducted included percentage distributions of the socio-demographic factors, GBV, the RH outcomes, as well as the fertility outcomes (mean CEB, mean achieved fertility and TFR). Thereafter, unadjusted and adjusted Poisson regressions were performed to test for associations between the independent and dependent (CEB) variables. Finally, multivariate Poisson regressions and path analysis were conducted. Multi-level analysis looked at CEB and each form of GBV in turn, whilst path analysis looked at the potential pathways in which each form of GBV affects CEB in Uganda. Full explanations of each of these multivariate techniques are provided in the sub-sections that follow. Excel, Population Analysis Software (PAS) and Stata version 14 were used for all analyses.

3.8.1 Objective 1: To examine the levels, trends and differentials of physical Gender-Based Violence and fertility amongst Ugandan women.

To answer this objective, this analysis first described the fertility trends from 1989 to 2011, whereas all subsequent analyses was for 2011 only. First, indirect estimation techniques of fertility were also used to compare with the figures of the actual or reported TFRs. The indirect estimation techniques used for this were the Brass P/F Ratio and the Relational Gompertz Model. The indirect estimation techniques and the actual reported TFRs (using the TFR2 functionality in Stata) were appropriate to assess the levels and trends in fertility in Uganda over the period 1989 – 2011, and to assess whether in fact there was a slow decrease in fertility decline in the country as well as to assess data quality and potential under- or over-reporting of children ever born amongst the respondents in the UDHS over the period. Therefore, an assessment of the reliability of the fertility rates and of children ever born were assessed. Each of the indirect estimation techniques are described below.

The Brass P/F Ratio is one of the earliest indirect estimation techniques for fertility, and in fact, most that have come after it have been attempts to refine the Brass P/F ratio's methodology and / or its assumptions. One of the greatest critiques of this method is the assumption of constant fertility (Zlotnik & Hill, 1981; Moultrie, 2013). The Brass P/F Ratio derives the level of fertility from children ever born or average parities (P), whilst the pattern of fertility is derived using the cumulated ASFRs over the last 12 months (F). In this way, if the P/F Ratio at any given age is equal to 1, it is said to be free of error and/or constant over time; and therefore, the closer the P/F ratio is to 1, the better the reported data. On the other hand, if the P/F ratio increases with age, one can assess that fertility has been decreasing over time. As such, this method is appropriate to assess whether fertility in the country has stalled, or whether it has declined over the period under review. Another assumption made by this method, is that reporting of births at younger ages are generally more reliable than those at older ages – hence the reason why reported births at younger ages are used as the adjustment (or correction) factors. A final assumption of the method is that if errors of under-reporting or over-reporting occur – they are the same for all ages, and this should therefore make no difference to the fertility pattern shown (UN, 1983; Brass, 1964; Moultrie, 2013). To better understand how the P/F ratio is computed, the following steps outline the methodology used (*information has been summarised from Manual X* (UN, 1983) and Brass, 1964):

1. Estimate reported parities for each age-group

$P_i = CEB_i / W_i$

where: Subscript i = age group; P = reported average parity of women; W = total number of women

2. Estimate the preliminary fertility schedule

$f_i = B_i / W_i$

where: f = fertility rate; B = number of births over the previous year

3. Estimate the cumulated fertility schedule: Computed by multiplying the computed fertility rates from step 2

$\Phi_i = 5 \left[\sum_{j=0}^{i} f\text{i}\right]$

4. Estimate average parity

$f_i = \Phi_{(i-1)} + af_i + bf_{(i+1)}$, for i=1,2,3,4,5,6

for i=7: $f_7 = \Phi_{(6)} + af_{(i-1)} + bf_{(7)}$

where: a and b = corresponding age group coefficients for interpolation between cumulated fertility rates

However, Coale and Trussell (1974, cited in UN, 1983) proposed fitting a second-degree polynomial to 3 consecutive values of cumulated fertility (Φ) to estimate average parity of women – the interpolation formula is:

$F_{(i)} = \Phi_{(i-i)} + a_{(i)}\, f_{(i)} + b_{(i)}\, f_{(i+i)} + c_{(i)}\, \Phi_{(7)}$

where: a, b and c parameters estimated using least-square regression to fit the equation to model cases from the Coale-Trussell fertility model.

5. Calculate fertility schedules for conventional five-year age groups: For this to occur, the unorthodox age groups (computed in Step 2) are weighted (except for age group 7, since child-bearing ceases at the end of the age interval) using:

$$f^{+}_{(i)}=\{I-W_{(i-I)}\}f_{(i)} + W_{(i)}f_{(i+i)}$$

where: $w_{(i)} = x_{(i)} + y_{(i)}f_{(i)}/ \Phi_{(7)} + z_{(i)}f_{(i+i)}/ \Phi_{(7)}$; the x, y and z coefficients are obtained by fitting the equation by least-square regression to the Coale-Trussell fertility model.

6. Adjust the period fertility schedule: P_i/F_i are calculated using quantities calculated in steps 1 to 5, allowing one to compare the average parity equivalents (F) to the average parities (P). Two adjustment or correction factors are used for period fertility rates – P_2/F_2, and P_3/F_3. However, a weighted adjustment or correction factor can be used – $K = (P_2/F_2 + P_3/F_3)/2$. Thus, an adjusted fertility schedule, $f^{*}_{(i)}$, is computed by multiplying the fertility rates for conventional age-groups, f^{+}_{i}, by the adjustment factor, K.

$$f^{*}_{i} = Kf^{+}_{i}$$

where: K = magnitude of under or over-reporting of observed current fertility compared to the average parities.

Computed quantities for all three adjustment factors are reported in this study.

7. Estimate Fertility Rates: From these adjusted fertility schedules, TFR can be estimated as TFR = $5\Sigma f^*_{(i)}$

The Relational Gompertz Model was introduced as a refinement and improvement on the Brass P/F ratio, given that with this method the assumption of constant fertility no longer exists and that estimated F values are less prone to errors in ages below 25 years than the conventional P/F Ratio. This method uses the same data as the Brass P/F ratio to estimate age-specific and total fertility. As with the Brass P/F ratio, the Relational Gompertz Model attempts to correct for under- and over-reporting errors of births; but also, for under-reporting of lifetime fertility and errors of age reporting in older ages (Moultrie, 2013). One of the pitfalls, however, of this method is that it requires information from 2 censuses or surveys (Moultrie, 2013; Brass 1981), and therefore for this study the Relational Gompertz Model could not be used for 1989 as there was no survey that preceded it. Though Brass (1981) himself first proposed the original methodology, subsequent revisions and improvements by Booth (1984) and Zaba (1981) have been incorporated into the calculation that are specific to high fertility countries and is now an often-used method in indirect estimations of fertility. If there are any changes to fertility over the period of investigation, the P and F values will diverge. According to Moultrie (2013) and Zaba (1981), typical errors and diagnostics that can be seen in the Relational Gompertz curve are as follows:

1. Older women omit children in reporting their lifetime fertility – P-values will be high, instead of a straight-line pattern and P-points will curve upwards at older ages

2. Exaggeration of births, or age exaggeration by older women - F-line curves downward at the oldest ages

3. Trends in fertility –

- If fertility has been falling - F-cumulants will be higher than the P-cumulants at the same age, and the F-points have a steeper slope than the P-points; and therefore, the F-points tend to lie on a line above that for the P-points. The versa is also true.
- If P-points are eliminated, and therefore P and F points are not aligned; one can derive that fertility has changed rapidly in younger ages.

To better understand how the Gompertz function was computed, the following steps outline the methodology used, which was specifically created for contexts where total fertility is 5 or higher (Hlabana, 2006), as is the case with Uganda.

The basic equation of the relational model is

1. $F_x/F = A^{Bx}$

where: F_x = cumulated fertility up to age x derived from age-specific fertility rates; F = total fertility rate by the end of the reproductive life. A and B = constants for a set of rates and lie between 0 and 1

The function in step 1 can be reduced to a linear function of age, by taking logarithms twice. Although this is not the preferred method, given that it violates the assumption of a straight line. Therefore, the preferred method is the standard female schedule for societies where total fertility 5 or more, in line with the Coale and Trussell model:

2. $Y_x = -\ln[-\ln(F_x/F)] = \alpha + \beta_x$

<u>*where:*</u> Y_x = fertility rate at age x

Thus, if $Y_{s(x)}$ represents a standard value the Gompertz function can be shown:

$Y_x = \alpha + \beta Y_{S(X)}$

<u>*where:*</u> α and β = parameters reflecting the fertility patterns of the population; α = intercept and β is the slope of the plot of the transformed fertility schedule s denotes the transformation for a standard age-specific fertility schedule.

Two procedures have been put forward to fit equation 2, either by using parity data (equation 3), or by using lifetime and current fertility data (equation 4) (Brass, 1996):

3. $Z(i) = -\ln[-\ln(Pi/Pi+1)]$

4. $Z(x) = -\ln[-\ln(Fx/Fx+5)]$

<u>*where:*</u> i = 1, …. 7 (five-year intervals); x = exact age

Equation 2, therefore, still holds – where F_x is replaced with $P_{i;}$

5. $Y_i = \alpha + \beta Y_{s(i)}$

6. $Y_j = -\ln[-\ln(P_i/F)]$

This is used to examine the age pattern of average parity, as well as compare the observed and calculated average parity by taking the average parity of each age-group as a proportion of the total fertility estimate or P/F ratio.

The series using the formula in equation 3 are calculated, and a graph of $Z_i - e_i$ is plotted and compared with the plotted g_i (standard) values; although the Z_i values are calculated from equation 3, the e_i and g_i are derived from standard distribution calculated by Brass himself. Gompertz parameters (α and β) are estimated from this fitted line in the graph, and applied to the standard values to compute the TFR. Therefore:

7. $P_i/F = \exp\{-\exp(-Y_i)\}$

The TFR is obtained by fitting the Relational Gompertz model to mean parities of young women, and cumulated fertility as shown as a proportion of the total cumulative fertility.

This is followed by showing fertility trends using direct measures; namely mean CEB, mean achieved fertility, and TFRs. The reported TFRs for each of the years were computed using the TFR2 module, created by Schoumaker (2013) specifically to be used with DHS data and which analyses birth history data. TFR2 can compute ASFRs and TFRs, reconstruct fertility trends and estimate fertility differentials. Three-year estimates are computed by five-year age groups. However, only the first of these was used for the purposes of this study. Schoumaker’s TFR2 module uses Poisson regression to compute ASFRs:

$$\log(\mu i) = \log(ti) + \alpha + \sum\_(k=20\text{-}24)^\wedge(45\text{-}49)\beta kAki$$

where: μi = expected number of CEB; ti = length of time; α = constant term; Aki = dummy variable for the six age groups (20-24 to 45-49, as 15-19 is the reference category)

The rate can then be expressed as:

$$\lambda i = \exp\left[\alpha + \sum_{k=20-24}^{45-49} \beta k A k i\right]$$

where: dummy variable A = 1 for the specific age group and = 0 for all other age groups

The total fertility rate is then equal to five times the ASFR

Subsequently, mean CEB, mean achieved fertility and TFRs were used to show fertility patterns and differentials according to each severity of GBV, RH outcomes and socio-demographic factors at all three levels (individual, household and community); as well as an unadjusted regression results between CEB with each form of GBV, the RH outcomes and all the socio-demographic factors to assess the bivariate associations between CEB and each of the explanatory factors included in the study. Tables show the respective ratios and p-values at a 0.05 level of significance. Results are presented as Incidence Risk Ratios (IRR) for the Poisson model for CEB.

In the Poisson regression model, the incidence rate for the jth observation:

$$rj = \exp(\beta 0 + \beta 1 * x(1,j) + \ldots + \beta k * x(k,j))$$

If: Ej is the exposure, the expected number of events Cj will be

$$Cj = Ej * rj = \exp[\ln(Ej) + \beta 0 + \beta 1 * x(1,j) + \ldots + \beta k * x(k,j)$$

However, rates are most easily compared when transformed into incidence risk ratios (IRR). The IRR, for one-unit change of xi:

$$\frac{\exp[\ln(E) + \beta 1x1 + \ldots + \beta i*(xi + 1) + ... + \beta kxk}{\exp[\ln(E) + \beta 1x1 + \ldots + \beta ixi + ... + \beta kxk} = \exp\beta i$$

The final part of this analyses revisited the fertility patterns and differentials according to RH outcomes and socio-demographic factors, but by each severity of GBV. This was used to assess the differences in patterns and differentials amongst those who had or had not ever experienced each form of GBV. All results for objective 1 are shown in Chapter 5.

3.8.2 Objective 2: To examine the individual and social context of physical GBV and fertility in Uganda.

The first part of the analysis conducted to answer objective 2 (results are shown in Chapter 6) was an adjusted Logistic regression model for all indirect or socio-demographic factors and RH outcomes as the independent variables, and each severity of physical GBV as the dependent variable. This was done to ascertain the level of association between the selected independent variables, with the RH outcomes, with each of the severities of physical GBV. This was followed by an adjusted Poisson regression model for all indirect or socio-demographic, moderator (physical GBV), RH outcomes (as the independent factors) and CEB (as the dependent factor). Three such models were presented, for comparative purposes – the first contains no GBV, the second contains less severe physical GBV and the third contains more severe physical GBV

Subsequently, Poisson multilevel analysis was conducted. Results are presented as Incidence Risk Ratios (IRR). Multilevel modelling, in general, allows us to study effects that vary by group, and allows us to estimate such interactions. Furthermore, by using multi-level modelling the study will also be able to estimate group averages and group-level effects on fertility and physical GBV; and allows us to provide a simultaneous model that incorporates both individual level and group level models (Gelman & Hill, 2007).

The random and fixed effects are shown and interpreted for both the sets of models for each of the fertility outcomes. The random effects are the variation measures, which account for variations in fertility across communities. The fixed effects, on the other hand, show the measures of association and are expressed as IRRs, significant at the 0,05 level of significance. On the other hand, the random effects were shown as the variance partition coefficient (VPC), which equates to the inter-class correlation and the percentage change in variance (PCV). The larger the value of the VPC, the more important is the community level factors in explaining variations in fertility. On the other hand, the PCV is calculated relative to the community variance within the reference model (Antai, 2011; De Wet, 2014; Twisk, 2006). Diagnostically, the Akaike Information Criterion (AIK) and the Bayesian Information Criterion (BIC) are used to determine the goodness of fit (Uthman& Kongnyuy, 2008) – and are also two of the diagnostic measures used to assess goodness of fit in path analysis (objective 4). The model with the lowest AIC and BIC are said to be the best fit model (Uthman & Kongnyuy, 2008).

The strength of the relationship between the outcome and predictor variables will be assessed using the coefficient of determination (or r^2) (Fleming & Nellis, 2000), and is also subsequently used in the assessment of the relationship in path analysis (objective 4). This will show the percentage variation in fertility that is explained by the regression line. The closer r2 is to one (1) the higher the variation in fertility is explained by the predictor variable. (Fleming & Nellis, 2000). Poisson multilevel analysis was chosen for children ever born and achieved fertility because both outcomes are count variables (Gelman & Hill, 2007; Twisk, 2006). The multilevel analysis was done using three levels of variables – namely individual-level, relationship-level and community-level variables.

For Poisson Multilevel Analysis, the random effects maximum likelihood model used in Stata:

$$Pr(Yit = yit \mid xit) = F(yit , xit\beta + vi)$$

(StataCorp, 2013)

In total 13 models were created. The first model (model 0) is simply used as the reference model. Thereafter, 4 model groups were created. The first group (models 1) included only the individual level factors together with the reproductive health outcomes. Models 2 and 3 included on the relationship level and community level factors each with the reproductive health outcomes, respectively. Finally, the models 4 were the full models (included the individual, relationship and community level factors with the reproductive health outcomes). Under each of the 4 groups, to assess the impact of each severity of physical GBV, three sub-models were included under each group. Sub-models (A) included no form of GBV. Sub-models (B) and (C) included less and more severe physical GBV, respectively:

Model 0 Empty or reference model, which included no independent variables

<u>Models A – No GBV</u>

Model A1 Including the RH outcomes and individual level factors

Model A2 Including the RH outcomes and household level factors

Models A3 Including the RH outcomes and community level factors

Models A4 Including the RH outcomes, individual level factors, household level factors and community level factors

<u>Models B – Less Severe Physical GBV</u>

Model B1 Including the RH outcomes and individual level factors, and less severe physical GBV

Model B2 Including the RH outcomes and household level factors, and less severe physical GBV

Models B3 Including the RH outcomes and community level factors, and less severe physical GBV

Models B4 Including the RH outcomes, individual level factors, household level factors and community level factors, and less severe physical GBV

<u>Models C – More Severe Physical GBV</u>

Model C1 Including the RH outcomes and individual level factors, and more severe physical GBV

Model C2 Including the RH outcomes and household level factors, and more severe physical GBV

Models C3 Including the RH outcomes and community level factors, and more severe physical GBV

Models C4 Including the RH outcomes, individual level factors, household level factors and community level factors, and more severe physical GBV

3.8.3 Objective 3: To determine the direct and indirect pathways through which physical GBV affects fertility in Uganda

Once fertility was contextually examined, analysis moved towards investigating and quantifying the direct and indirect pathways within which GBV may influence fertility in Uganda using Pathway Analysis.

Path analysis uses the path diagram to help social scientific theories of causal relationships in which a “system of relationships in which some variables affect other variables and these in turn influence still other variables in the model.” Therefore, path analysis diagrams show the hypothesised causal relationships in the model (Lleras, 2005; Loebner & Driver, 1973; Chi & Harris, 1979; Islam, 2009). The causal relationships can be direct (go directly from one variables to another) or indirect (relationship between two variables is mediated by one or more variables).

Therefore, path analysis shows the hypothesised relationships in the model, allowing one to create a model hypothesising causal relationships and calculating the strengths using path coefficients (or the standardised regression coefficients) from the explanatory or independent factors towards the outcome factor (Chi & Harris, 1979; Islam, 2009) – which in this study are children ever born and achieved fertility. A further benefit of path analysis is that one may also draw a path diagram which diagrammatically portrays the hypothesised paths and relationships between different factors (Lleras, 2005; Loebner & Driver, 1973). The causal relationships can be direct (go directly from one variables to another) or indirect (relationship between two variables is mediated by one or more variables). Thus, using path analysis one can quantify the direct effect, the indirect effect and the total effect of the determinants on the outcome variable (Lleras, 2005; Loebner & Driver, 1973; Islam, 2009) – indirect effects are estimated by multiplying the path coefficients of each of the connecting paths (Chi & Harris, 1979), whilst the arrow heads show the direction in which the hypothesised relationship is working (Islam, 2009). In path analysis variables are known as either exogenous or endogenous variables. Exogenous variables are those whose causes lie outside of the model (or indirect determinants – the individual level socio-demographic factors), whereas endogenous variables are those whose causes lie within the model (or direct RH outcomes), a moderating factor (such as GBV in this study) is often included as an additional endogenous factor.

Furthermore, path analysis examines the relative strength of each of the different effects on the outcome (in this case, fertility) (Lleras, 2005; Loebner & Driver, 1973; Islam, 2009). Path analysis follows the same assumptions as least square regression and all relationships are assumed to be linear, additive and causal (Lleras, 2005). Therefore, each endogenous variable is regressed on the variables with direct paths leading to it. The error terms are exogenous independent variables not directly measured and reflect unspecified causes of variables in the outcome. Each independent (direct and indirect) is assumed to be a cause, and not an effect of fertility or GBV. Analysis included an analysis of the values of the path coefficients – if this figure was large, this meant that much of the effect is explained by variables that have not been included in the analysis (Loebner & Driver, 1973). Each independent (direct and indirect) is assumed to be a cause, including GBV, and not an effect of fertility.

The previous analyses; as well as logic, the literature and the conceptual framework were used to first assess which variables were to be included. Three models were created, and then assessed to see the model fit. The first model was the null model, and therefore did not include any severity of GBV. Subsequently, each model which assessed the contribution of each severity of physical GBV in turn with CEB. Although, hypothetically, all socio-demographic factors and SHR outcomes are thought to work through each form of GBV to increase fertility, each factor's direct and indirect effect is thought to contribute differentially to increasing fertility in a recursive way. Path analysis allows for this calculation.

Thus, using path analysis one can quantify the direct, indirect total effects of the determinants on the outcome variable (Lleras, 2005; Loebner & Driver, 1973; Chi & Harris, 1979; Islam, 2009). A few studies have attempted to use path analysis to examine effects on fertility. One study, conducted in India, used path analysis to investigate the effect many socio-economic variables on fertility and contraception (Loebner & Driver, 1973), whilst others have attempted to explain the influence of socio-demographic factors on fertility in Bangladesh (Islam, 2009), Columbia (Chi & Harris, 1979) and Africa (Mauldin, 1978). However, GBV was not included as a possible mediating or direct factor that could influence fertility levels in any of the studies. Furthermore, path analyses conducted on an African country has not been conducted in recent years.

Model Fitting: The fit statistics for each of the models were assessed. Explanations regarding the coefficient of determination, the AIC and the BIC have already been provided under objective 3. Other diagnostics used in the path analysis included were Root Mean

Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) (sometimes referred to the Non-Normed Fit Index), Standardised Root Mean Squared Residual (SRMR). A RMSEA and SRMR of below 0.5, and a CFI and TLI of above 0.9 all show model goodness of fit (Lleras, 2005). The RMSEA shows how close the model replicates real life (Kaplan, 2000), but also considers how complex the model is given that it is calculated using degrees of freedom (Cangur & Ercan, 2015). The TLI and CFI, on the other hand, are known as “incremental fit indices” and compare a null model in relation to other models being tested (Bentler, 1990; Cangur & Ercan, 2015). Finally, the SRMR is a useful measure given that it is independent of sample size. The SRMR provides “an index of the average standardised residuals between the actual observed and the hypothesised covariance matrices” (Cangur & Ercan, 2015).

3.9 Ethical Issues

The study analysed existing datasets using secondary data. Given that data collected was anonymised at the collation stage and no personal names or other identifiers were collected, respondents’ information remained anonymous and confidential. To access the data, a request for the Ugandan DHS datasets was made on the DHS Program website (www.dhsprogram.com). Therefore, ethical permission to use the Ugandan Demographic and Health Survey data was provided by ICF Macro Inc. (USA), who have full knowledge and a description of the study.

All DHS Surveys undergo a rigid ethical review to ensure the privacy and confidentiality of participants. All procedures and questionnaires must first be approved by the ICF Institutional Review Board as well as a review board of the host country. This process ensures that each survey complies with the American “Department of Health and Human Services regulations for the protection of human subjects (45 CFR 46), while the host country IRB ensures that the survey complies with laws and norms of the nation”. Furthermore, all participants are provided with details of the survey, including any risks and benefits of participation. Only once they have agreed to the partake in the survey, they are requested to sign and provide informed consent. Interviews and biomarkers are done in private, and all interviewers and field staff are provided with high level training which includes ethical procedures and issues of anonymity, privacy and confidentiality (https://dhsprogram.com/What-We-Do/Protecting-the-Privacy-of-DHS-Survey-Respondents.cfm, Retrieved 26 January 2018).

3.10 Dissemination Plan: Specific Manuscripts and Conferences

Findings and results of the study have been, and are to be, presented at both South African and International conferences. Furthermore, two papers have been published and two further planned papers will be submitted to peer-reviewed journals. Further journal publications will be completed post-doctorly.

Parts of the study have been presented at 3 national conferences, one of which was the South African Professional Association’s Conference (Population Association of

Southern Africa). A further 4 papers have been presented (oral presentations) at 3 international conferences. Finally, three abstracts have been accepted at 2 international conferences, but have not yet been presented.

The table below presents the names of the journals, title of the article and the status of these submissions. The table below also provides a breakdown of the conferences attended, conferences for which abstracts have been accepted, as well as those which have been submitted and awaiting final responses.

Table 3.5: Information and Status of Conference and Journal Submission of Study Results for Dissemination of Findings

	Title of Submission	Conference / Journal Name	Status
		Conferences	
1	The Association Between GBV and Fertility in Uganda: Preliminary Results	Annual Conference of the National Institute of Humanities and Social Sciences 2016 (*Johannesburg, South Africa*)	**Completed**
2	Gender-Based Violence and Fertility in Uganda – The complex relationship between two key challenges women face	Annual Conference of the Population Association of South Africa 2017 (*Pretoria, South Africa*)	**Completed**
3	Reproductive Health Outcomes and Gender-Based Violence – their direct and indirect links to fertility levels	University of the Witwatersrand School of Public Health Research Day 2017 (*Johannesburg, South Africa*)	**Completed**
4	What is the association between IPV and Fertility in Uganda?	International Sociological Association Conference 2018 (*Singapore, Singapore*)	**Completed**
5	Young age at first cohabitation: a risk factor of Gender-Based Violence and high unwanted fertility	International Sociological Association Conference 2018 (*Singapore, Singapore*)	**Completed**
6	Physical IPV: The unexplained moderator of high fertility in Uganda	PopFest 2018 *(Oxford, UK)*	**Completed**
7	The Influence of physical Intimate Partner Violence (IPV) on the reproductive health outcomes of Internal migrants and non-migrants in Uganda	The Migration Conference 2018 *(Lisbon, Portugal)*	**Completed**
8	A new understanding of the complex relationship between Gender-Based Violence and adverse reproductive health outcomes: a new theoretical model	2018 Word Social Science Forum (*Fukuoka, Japan)*	***Accepted***
9	Gender-Based Violence (GBV) and Reproductive Health amongst Women with Disabilities in Angola, South Africa and Uganda	2018 Word Social Science Forum (*Fukuoka, Japan)*	***Accepted***

10	The Interlink between Intimate Partner Violence (IPV) and Fertility: Partner Asymmetry and Gender Inequality	International Conference of Family Planning 2018 *(Kigali, Rwanda)*	***Accepted***
	Peer Reviewed Journals		
1	What is the association between GBV and Fertility Rates in Uganda?	Population Horizons	**Published**
2	Young age at first cohabitation: a risk factor of Gender-Based Violence and high unwanted fertility	South African Journal of Child's Health	**Published**
3	A contextual analysis of fertility in Uganda	African Journal of Reproductive Health	*To be Submitted – 30 August 2018*
4	The direct and indirect contribution of GBV to reproductive health outcomes and high fertility rates	Journal of Interpersonal Violence	*To be Submitted – 30 October 2018*

CHAPTER FOUR

CHARACTERISTICS OF THE RESPONDENTS

4.1 Introduction

This chapter describes the characteristics of the respondents (women of reproductive age included in the domestic violence module of the 2011 UDHS) according to socio-demographic factors, severity of physical GBV as well as the Reproductive Health outcomes of Ugandan women of reproductive age. A description of the population by the individual, household and community level socio-demographic factors identified in the literature are first provided. This is followed by the percentage distribution of the RH outcomes of Ugandan women of reproductive age – current contraceptive method, whether the previous pregnancy was planned, and whether the women ever experienced a termination of pregnancy (whether the women ever experienced a stillbirth or miscarriage, or ever had an abortion). Thereafter, this section provides the percentage distributions of Ugandan women who experienced less and more severe physical GBV, as well as those who experienced either less or more severe physical GBV and those that experienced both severities of physical GBV.

4.2 Description of Respondents by Individual, Household and Contextual Factors

Uganda has numerous ethnic groups, some of which are larger than others. Smaller ethnic groups were grouped and classified as “other”, which together constituted almost half (49.76%) of all Ugandan women of reproductive age (Table 4.1). The larger ethnic groups were individually classified – 17.58% of women were Muganda and 10.17% were Munyankole. Musoga, Mukiga and Ateso women each constituted around 7% of Ugandan women of reproductive age.

Catholics constitute the largest religious group with 39.81%, followed by those who belonged to the Protestant religion (29.74%). Almost 14% were of the Muslim and the Pentecostal religions, while only around 1% were from SDA or other minor religions in the country.

With respect to the highest level of education attained, most women had attained at least some schooling. Almost 6% of Ugandan women of reproductive age had a higher than secondary level of schooling, whilst 14.12% had no education at all. Almost two thirds (58.34%) and almost one in five (22.17%) women of reproductive age had a primary and secondary level of schooling, respectively. Of these women, 69.24% classified themselves as being employed.

Almost 60% of Ugandan women of reproductive age first cohabitated between the ages of 15 to 19 years, and a further 16.89% first cohabitated below the age of 15 whilst 19.92% first cohabitated between 20 and 24 years of age. However, less than 5% of

Ugandan women of reproductive age first cohabitated at age 25 years or older. Most women (80.08%) stated that they were either solely or in partially involved in big household decisions, while 19.92% were not involved in any household decisions at all.

Table 4.1: Percentage Distribution of Women by Individual Characteristics [UDHS, 2011]

		N	%
Ethnicity			
Muganda		365	17.58
Munyankole		211	10.17
Musoga		160	7.74
Mukiga		158	7.60
Ateso		148	7.15
Other		1032	49.76
	Total	**2074**	**100**
Religion			
Catholic		825	39.81
Protestant		617	29.74
Muslim		280	13.52
Pentecostal		288	13.89
SDA		40	1.95
Other		23	1.09
	Total	**2073**	**100**
Educational Status			
No education		293	14.12
Primary		1210	58.34
Secondary		460	22.17
Higher		111	5.37
	Total	**2074**	**100**
Employment Status			
Not employed		638	30.76
Employed		1436	69.24
	Total	**2074**	**100**
Age at First Cohabitation			
Under 15 Years		293	16.89
15-19 Years		1022	58.85
20-24 Years		346	19.92
25 and Above		75	4.34
	Total	**1737**	**100**
Household Decision-Making			
Women Not Involved in Decision-Making		293	19.92
Women Involved in Decision-Making		1180	80.08
	Total	**1473**	**100**

In Table 4.2 below it is shown that around 19% of household in which Ugandan women lived in were classified as the poorest or poorer households each. The lowest percentage of households were classified as middle wealth status, whilst 1 in 5 households were classified as richer (20.26%) and 1 in 4 were classified as richest (24.14%).

Over a quarter (28.54%) of husbands or partners of the respondents wanted the same number of children than the woman wanted, while only 8.44% wanted less than the woman in the relationship. Almost a third (32.04%) of the husbands or partners wanted more children than the woman in the relationship.

Table 4.2: Percentage Distribution of Women by Household Characteristics [UDHS, 2011]

	N	%
Household Wealth		
Poorest	383	18.46
Poorer	403	19.41
Middle	367	17.74
Richer	420	20.26
Richest	500	24.14
Total	**2073**	**100**
Asymmetry of Desired Number of Children		
Both want same	409	28.54
Husband wants more	459	32.04
Husband wants less	121	8.44
Don't know	444	30.99
Total	**1433**	**100**

The table below (Table 4.3) shows the distribution and percentage distribution of the community-level characteristics of Ugandan women of reproductive age. Just over one in ten women were from Central 1 (11.43%), Central 2 (11.12%), Western (13.09%) and the Southwest (13.23%) regions. Furthermore, just less than one in ten women were from East Central (9.68%), North (9.13%) and the Kampala (8.78%) regions. A further 5.59% and 3.30% were from the West-Nile and Karamoja regions, respectively. Amongst these women, the greatest percentage of them (81.57%) resided in rural areas.

Around 35% of women lived in communities were the percentage of women who had at least a secondary education been either medium or low, whilst only 29.15% of women lived in communities where the percentage was high. Around 37% of women lived in areas where the percentage of women in households classified as richer or richest was low, and 28.60% were living in communities were these percentages were high.

Thirty-six percent (35.71%) and 44.14% of Ugandan women of reproductive ages lived in areas where the percentage of women who had experienced less and more severe physical GBV was low, respectively. However, 33.28% and 26.24% of Ugandan women of reproductive ages lived in communities where a high percentage of women experienced less and more severe physical GBV, respectively.

Table 4.3: Percentage Distribution of Women by Community Characteristics [UDHS, 2011]

		N	%
Region			
Kampala		182	8.78
Central 1		237	11.43
Central 2		231	11.12
East Central		201	9.68
Eastern		304	14.64
North		189	9.13
Karamoja		69	3.30
West-Nile		116	5.59
Western		271	13.09
Southwest		274	13.23
	Total	**2074**	**100**
Place of Residence			
Urban		382	18.43
Rural		1691	81.57
	Total	**2074**	**100**
Community Level of Female Education			
Low		735	35.46
Medium		734	35.39
High		604	29.15
	Total	**2074**	**100**
Community Level of Wealth			
Low		755	36.39
Medium		726	35.01
High		593	28.60
	Total	**2074**	**100**
Community Level of Less Severe Physical GBV			
Low		740	35.71
Medium		643	31.02
High		690	33.28
	Total	**2074**	**100**
Community Level of More Severe Physical GBV			
Low		915	44.14
Medium		614	29.62
High		544	26.25
	Total	**2074**	**100**

4.3 Description of Respondents by Reproductive Health Outcomes

The highest percentages of women (75.44%) were using no contraceptive method at the time of the survey, whilst 22.01% were using a modern contraceptive (Table 4.4). However, over half (52.60%) of Ugandan women of reproductive age stated that their previous pregnancy was planned, while 47.40% stated that it was not. Furthermore, 1 in 5 women (20.88%) had ever had a pregnancy terminated – either as an abortion, still birth or miscarriage.

Table 4.4: Percentage Distribution of Women by Reproductive Health Outcomes [UDHS, 2011]

		N	%
Current Contraceptive Method			
No Method		1564	75.44
Traditional Method		53	2.55
Modern Method		456	22.01
	Total	**2074**	**100**
Intention of Previous Pregnancy			
Birth Not Planned		633	47.40
Birth Planned		702	52.60
	Total	**1335**	**100**
Ever Had a Pregnancy Terminated			
No		1641	79.12
Yes		433	20.88
	Total	**2074**	**100**

4.4 Description of Respondents by Prevalence of Physical GBV by Severity

Table 4.5 below shows that 41.23% had ever experienced less severe physical GBV. In other words, they had either been pushed, shook, or had something thrown at them; slapped; punched; twisted or hair pulled by an intimate partner or husband. Just over 1 in 5 had ever experienced more severe physical GBV. This means that 22.05% of

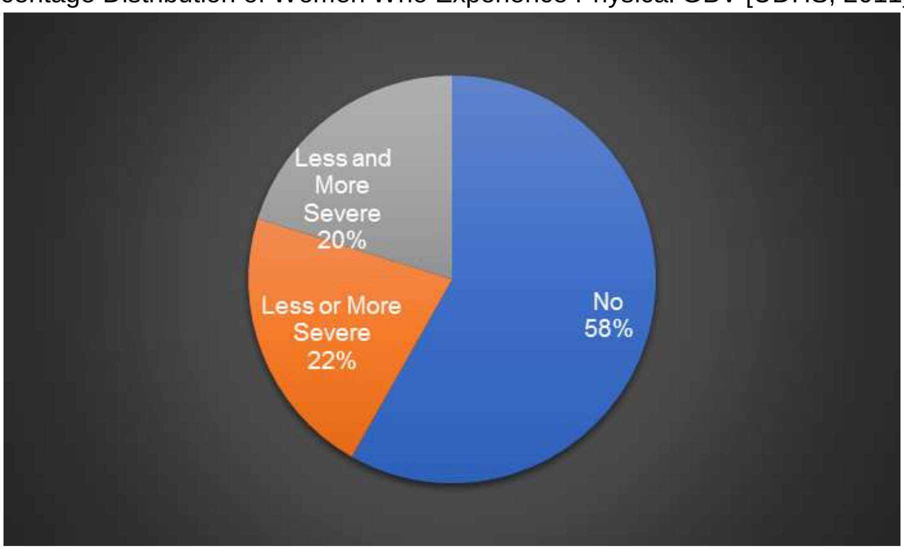
Ugandan women of reproductive age had ever been kicked or dragged; strangled or burned; threatened with knife or gun or another weapon by their legal husband or partner.

Table 4.5: Percentage Distribution of Emotional, Sexual, Less Severe and More Severe GBV [UDHS, 2011]

	N	%
Less Severe Physical GBV		
No	931	58.77
Yes	653	41.23
Total	**1584**	**100**
More Severe Physical GBV		
No	1235	77.95
Yes	349	22.05
Total	**1584**	**100**

Furthermore, figure 4.1 shows that 20% of Ugandan women of reproductive age had experienced both less and more severe GBV in their lifetime, while 22% had experienced either less or more severe GBV.

Figure 4.1: Percentage Distribution of Women Who Experience Physical GBV [UDHS, 2011]



4.5 Summary of the Chapter

This chapter provided a description of the study population by the individual, household and community level factors; as well as by the RH outcomes and severity of physical GBV. The largest percentages of Ugandan women of reproductive age were classified as “other” and constituted many minor ethnic groups, this however was followed by women who were either Munyankole or Muganda. Furthermore, most of the women were of Christian denominations, mainly Catholic, Protestant or Pentecostal.

Almost 60% of women of reproductive age in Uganda have a primary education as their highest educational qualification, and only 22.17% and 5.37% have completed their secondary and some form of tertiary education, respectively. Furthermore, over a third of Ugandan women of reproductive age lived in communities where percentage of women with at least secondary schooling was low, and only 29% lived in communities with high percentage of women with secondary education (at least). However, the smallest percentage of women (30%) stated they were not employed at the time of the survey, and over 80% of women stated that they were either solely or in part involved in key household decisions. Furthermore, almost 95% of women in Ugandan have first cohabitated by the age of 24 years, 60% of these women first cohabitate with an intimate partner between the ages of 15 and 19 years.

Almost a third of women had husbands or partners who wanted more children than they did, and only 8.44% of husbands or partners wanted less children than the woman in the relationship. In total, around 45% of women lived in households classified as either richer or richest, while around 38% lived in households classified as poorer or poorest.

However, while 28.60% of women lived in communities where the percentage of households that were classified as richer or richest were high, 36.39% of women lived in communities where there were low percentages of richer or richest households.

Although Kampala is the main urban centre, only 8% of women live in this region; while most women live in the central, eastern and southern regions of the country. Furthermore, most Ugandan women – over 80% - live in rural areas in the country.

The highest percentage of women were not on any form of contraception at the time of the interview (75%), while almost 3% were on traditional forms of contraception. However, just over 50% of women stated that their last birth was intended, but almost 21% had experienced a termination of pregnancy.

Forty-one percent of Ugandan women had experienced less severe forms of physical GBV, and 22% had experienced more severe forms. However, 20% of women had experienced both less and more severe physical GBV by an intimate partner. While 35.71% and 44.41% of women lived in communities where the percentage of women that experienced less and more severe physical GBV were low, 33.28% and 26.25% lived in communities were these percentages were high, respectively.

CHAPTER FIVE

LEVELS, TRENDS AND DIFFERENTIALS OF FERTILITY OF UGANDAN WOMEN

5.1 Introduction

This section outlines the levels, patterns and differentials of fertility by selected socio-demographic factors (at the individual, household and community level), the RH outcomes and each severity of physical GBV. Fertility levels show data from 1989, 1995, 2000, 2006 and 2011 to show the levels for each year and the fertility trends leading to 2011. This provides a better understanding of the fertility context leading to the 2011 DHS. Subsequent analyses in this chapter for fertility differentials, as well as in subsequent chapters, are for women of reproductive age included in the domestic violence module of the UDHS 2011 only.

Firstly, to assess the quality of the DHS data collected, and to assess whether in fact the trends in fertility in the country have been marked with an increase, decrease or stall in the country the Brass P/F ratio and the Relational Gompertz Model are used as the indirect estimation techniques. In this sub-section a detailed analysis of the two chosen indirect estimation techniques – the Brass P/F Ratio and the Relational Gompertz Model – are provided. The Brass P/F Ratio results by both the P/F ratios by age of the mother for each of the years, as well as the adjusted ASFRs by P/F ratio for the same period. Thereafter, the results on the Relational Gompertz Model, also provides the results in figures showing the Gompertz Functions showing the implied TFRs to assess reporting errors and trends in fertility in Uganda between 1989 and 2011.

The final section looks at the fertility differentials. Subsequently, mean CEBs, achieved fertility rates and reported TFRs are shown for each of the socio-demographic characteristics, RH outcomes and each severity of physical GBV. This is reported to show the differentials of Ugandan women of reproductive age according to these key outcomes and characteristics. Finally, the purpose of this study is to assess the relationship between GBV and fertility, whereby GBV acts as a mediating effect working with the socio-demographic factors and RH outcomes to either increase of decrease fertility. As such, the final part of this chapter reports the fertility differentials of Ugandan women according to the socio-demographic factors and RH outcomes, by each severity of physical GBV.

5.2 Indirect Estimation Techniques

5.2.1 Brass' P/F Ratio Method

Figure 5.1 shows the graphical representation for P/F Ratios by the Age of the UDHS's 1989, 1995, 2000, 2006 and 2011; while figure 5.2 – 5.6 show the graphical representation of the Adjusted ASFRs by P/F Ratio for the same years, respectively [Tabular results shown in Table B1 in Appendix B]. Although a full description of Brass's P/F Ratio method is provided in Chapter 3, the Brass P/F Ratio method produces adjustment factors to correct data errors to show adjusted fertility levels. In this case, where P (the average parity / cumulated lifetime fertility of a cohort of women) and F (the cumulated period fertility) are the same or similar, one would conclude that fertility had remained constant over time and the P/F ratio would be 1. With the Brass P/F Ratio the level of fertility is derived from CEB or average parities, whilst the age pattern of fertility is derived from the ASFRs or reported fertility rates in the past 12 months (Hlabana, 2006; Brass, 1964).

Therefore, if P/F Ratios increase as age increases, fertility could in fact be decreasing. Alternatively, where P/F ratios are high at older ages, one could observe that this is due to one or more of the following reasons: there may be reporting errors in current fertility rates, current births may have been under-reported, or lifetime fertility may have been over-reported although it is normally the case that women at older ages generally omit or under-report their average parity. Correspondingly, one of the assumptions is that births reported by women in the younger age groups are generally more accurate, therefore it is normally accepted that the correction factor of women aged 20-24 and/or 25-29 is normally the most reliable (Moultrie 2013; Hlabana, 2006; Brass 1981). It is sometimes not altogether clear whether changes seen are due to actual changing patterns of fertility or due to reporting errors, and one should be mindful of this in interpreting P/F Ratios (Brass 1996).

The P/F ratios for the age groups 15-19, 20-24 (except in 2006) and 30-34 (except in 2006 and 2011) are slightly below 1; indicating that observed children ever born was slightly underreported amongst these age groups. Whilst for those aged 20-24 in 2006, 25-29, 30-34 in 2006 and 2011, 35-39, 40-44 and 45-49 the P/F Ratio was slightly over 1 – indicating that amongst these age groups, the reported children ever born were slightly over reported. Furthermore, in 1989, according to the reported births a woman would have an average of 7 children (TFR=7.386) by the end of her reproductive life, which is on par with the range of the implied TFRs based on the average parities which imply that a Ugandan woman of reproductive age in 1989 would bear between 6.909 to 7.489 - dependant on whether the adjustment factor used the average P/F Ratios of women aged 20-24, 25-29, 30-34 or the average of 25-29 and 30-34-year olds.

On the other hand, in 1995, the P/F ratios show that in the younger age groups (15-19 until 30-34 years) the observed children ever born were underreported amongst all these age groups, although only slightly. On the other hand, amongst those aged 35 years and above, women over reported their actual number of children ever born; although only moderately so. In 1995, the reported TFR was 6.858; whereas the implied TFRs in 1995 showed that Ugandan women of reproductive age would bear between 6.096 and 6.789 children by the end of their reproductive life-cycle. The reported TFR was therefore higher than the range of implied TFRs from the Brass P/F Ratio method.

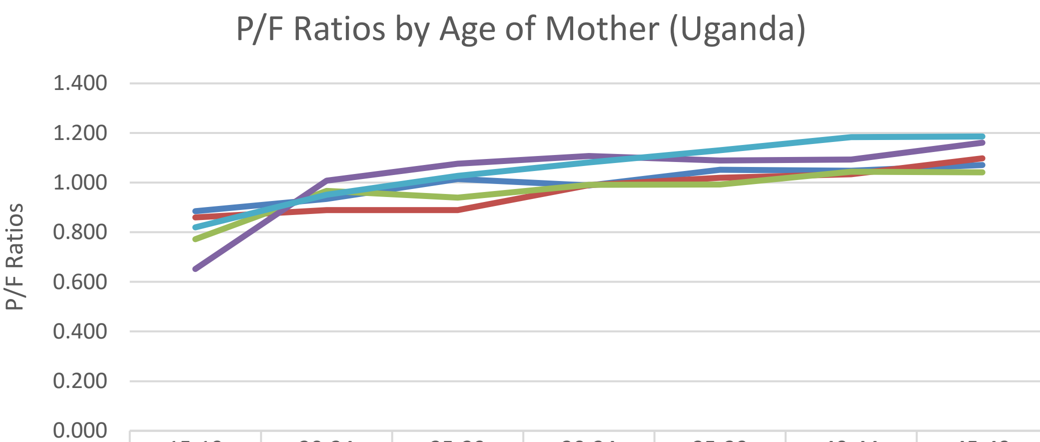
The 2000 figures show a similar pattern to those seen in 1995, where the lower age groups (up to the age group 35-39) show P/F ratios slightly lower than 1 deducing a slight underreporting of actual number of children ever born, while the older age groups had P/F ratios that were slightly higher than 1. In 2000, as in 1995, the actual TFR (6.852) was higher than the range of implied TFRs – whereby a Ugandan woman would bear between 6.439 and 6.792 children by the end of her reproductive life-cycle.

On the other hand, except for age group 15 to 19 years, all other age groups in 2006 had a P/F ratio of slightly higher than 1; showing that all other age groups except 15 to 19 years slightly over reported their actual number of children ever born. This could explain the slightly lower reported TFR of 6.673 from the 2000 rate of 6.852. Unlike in 1995 and 2000, the reported TFR was within the range of the implied TFRs for the P/F ratio adjustment factors – Ugandan women in 2006 would bear between 6.728 and 7.383. However, P/F ratios which used the adjustment factor of the average P/F Ratios of women aged 25-29, 30-34 or the average of 25-29 and 30-34-year olds had a higher implied TFR than the reported TFR.

In 2011, the opposite trend was seen, in that the P/F ratios for age categories 15-19 and 20-24 was below 1 – meaning that the actual number of children ever born reported by Ugandan women in the 2011 UDHS was slightly underreported for these age groups. On the other hand, the remaining age groups show P/F ratios above 1 – meaning that, at older ages, the actual number of births were over-reported. As such, the actual TFR could in fact be lower than the calculated TFR of 6.200. Furthermore, according to the implied TFRs a Ugandan woman in 2011 would have born between 5.887 and 6.697 children by the end of her reproductive life – a lower range to the implied TFRs for those in 2006. This shows that there as a considerable decrease in the TFR between 2006 and 2011.

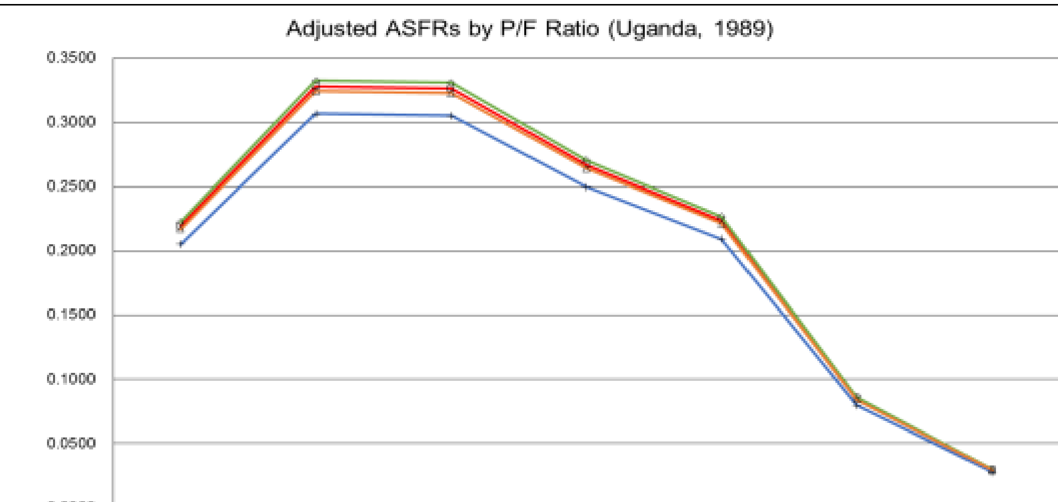
Fertility, in Uganda from 1989 to 2011, does however seems to have decreased oved the period, after a slight stall from 1995 to 2000 – which is consistent with the literature. Throughout the period, average parities show that child-bearing begins at very young ages in Uganda – and this has remained relatively unchanged over the entire period. By the time women in Uganda reach 20 to 24, women already have close to two children – this subsequently increases by around 1 child extra by each increase in age group.

Figure 5.1: P/F Ratios by Age of Mother [UDHS; 1989, 1995, 2000, 2006, 2011]



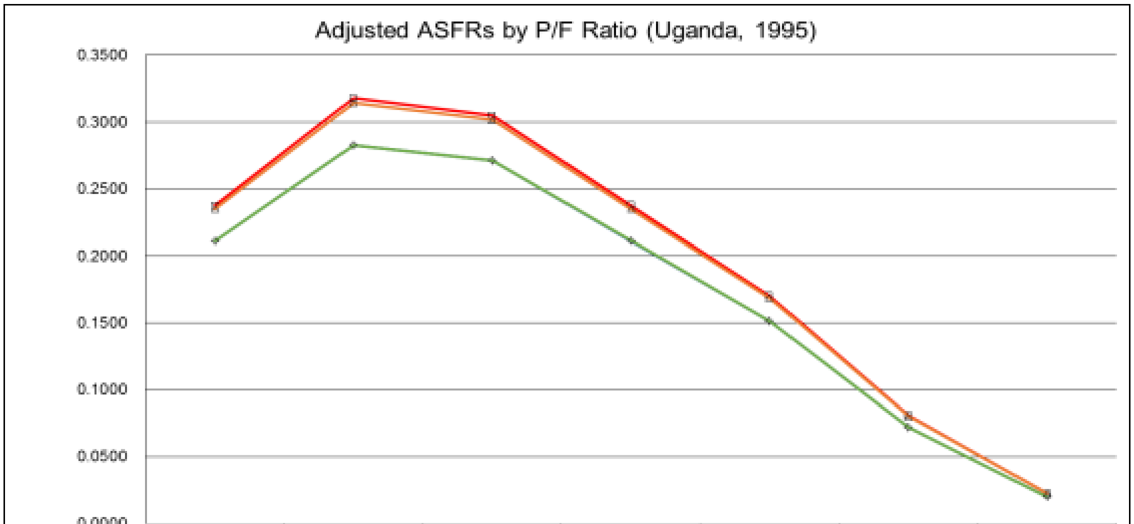
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1989	0.885	0.935	1.014	0.989	1.052	1.048	1.071
1995	0.860	0.889	0.890	0.990	1.020	1.034	1.098
2000	0.772	0.967	0.940	0.991	0.993	1.044	1.042
2006	0.652	1.008	1.077	1.107	1.089	1.093	1.161
2011	0.820	0.951	1.028	1.082	1.130	1.184	1.186

Figure 5.2: Adjusted ASFRs by P/F Ratio [UDHS, 1989]



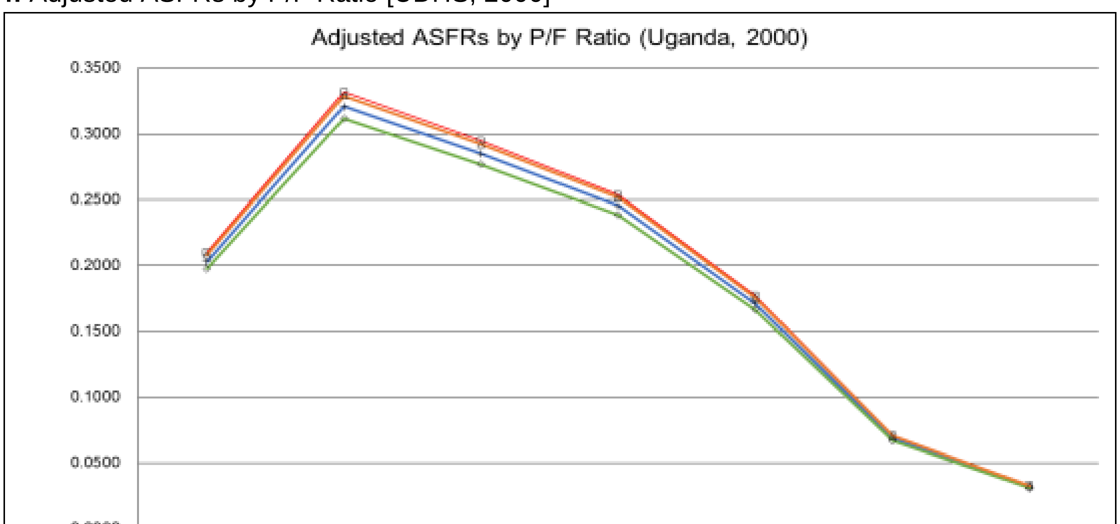
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Reported	0.2190	0.3279	0.3262	0.2666	0.2235	0.0848	0.0293
P2/F2	0.2049	0.3067	0.3051	0.2494	0.2090	0.0793	0.0274
P3/F3	0.2221	0.3325	0.3307	0.2703	0.2266	0.0860	0.0297
P4/F4	0.2167	0.3244	0.3227	0.2637	0.2211	0.0839	0.0290

Figure 5.3: Adjusted ASFRs by P/F Ratio [UDHS, 1995]



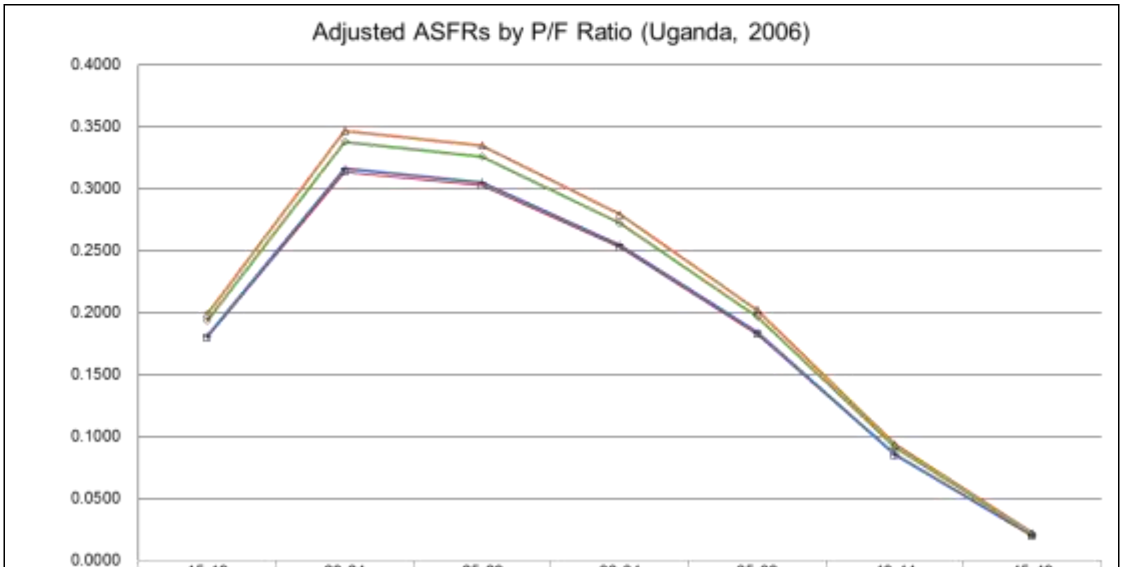
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Reported	0.2374	0.3179	0.3051	0.2376	0.1703	0.0808	0.0225
P2/F2	0.2110	0.2826	0.2712	0.2112	0.1513	0.0718	0.0200
P3/F3	0.2114	0.2831	0.2716	0.2116	0.1516	0.0719	0.0201
P4/F4	0.2350	0.3147	0.3020	0.2353	0.1686	0.0800	0.0223

Figure 5.4: Adjusted ASFRs by P/F Ratio [UDHS, 2000]



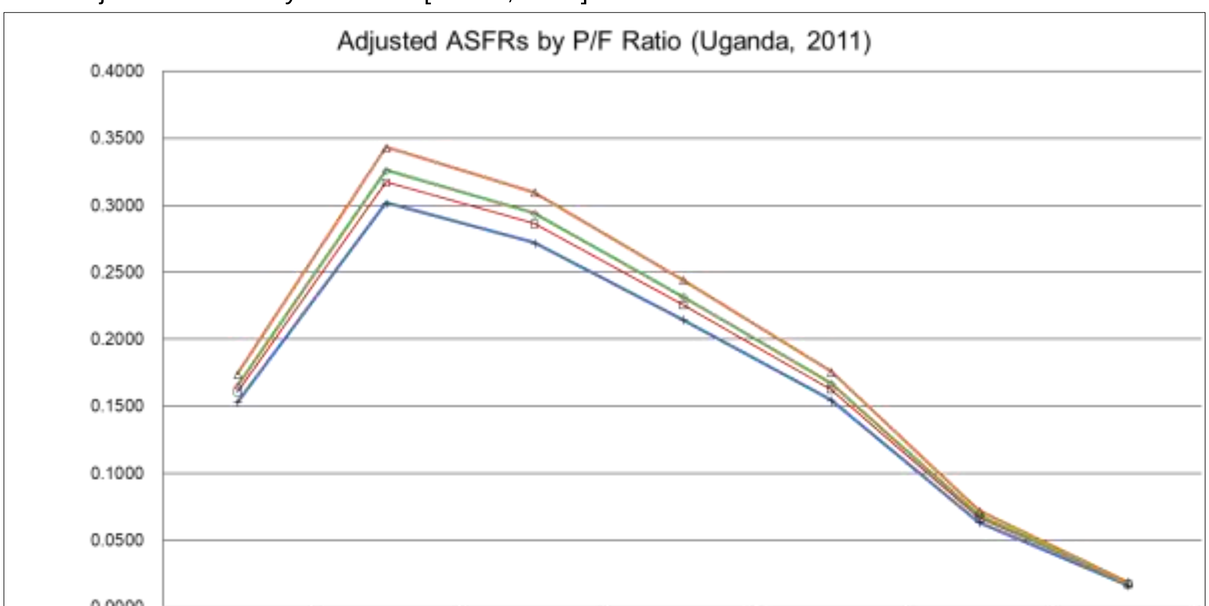
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Reported	0.2099	0.3317	0.2946	0.2536	0.1770	0.0709	0.0328
P2/F2	0.2029	0.3207	0.2848	0.2452	0.1712	0.0685	0.0317
P3/F3	0.1972	0.3117	0.2768	0.2383	0.1664	0.0666	0.0309
P4/F4	0.2080	0.3288	0.2920	0.2514	0.1755	0.0703	0.0325

Figure 5.5: Adjusted ASFRs by P/F Ratio [UDHS, 2006]



	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Reported	0.1796	0.3134	0.3024	0.2523	0.1825	0.0846	0.0198
P2/F2	0.1810	0.3159	0.3049	0.2544	0.1840	0.0853	0.0200
P3/F3	0.1935	0.3376	0.3258	0.2719	0.1966	0.0911	0.0213
P4/F4	0.1987	0.3467	0.3346	0.2792	0.2019	0.0936	0.0219

Figure 5.6: Adjusted ASFRs by P/F Ratio [UDHS, 2011]



	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Reported	0.1610	0.3173	0.2863	0.2260	0.1628	0.0670	0.0177
P2/F2	0.1531	0.3018	0.2723	0.2149	0.1548	0.0637	0.0168
P3/F3	0.1655	0.3261	0.2942	0.2322	0.1673	0.0688	0.0182
P4/F4	0.1742	0.3433	0.3098	0.2445	0.1761	0.0724	0.0191

5.2.2 Relational Gompertz Model

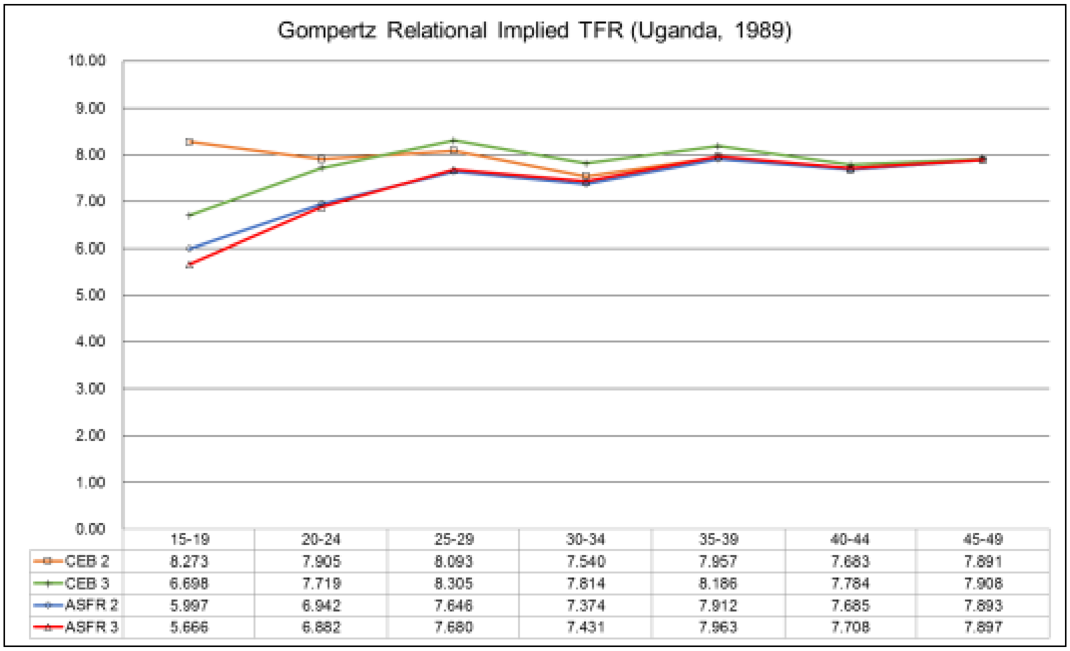
Even though the Brass P/F Ratio method does show signs that the fertility in Uganda has declined overall over the period 1989 to 2011, there are authors who question the assumptions of the model and whether such assumptions do not lead to distorted results (Hlabana, 2006). As such, the Relational Gompertz Model was introduced as a refinement of the Brass P/F Ratio method, in that it does not assume constant fertility and uses the average parities for all ages. Furthermore, the Relational Gompertz Model corrects for the under-reporting and errors of reported births and fertility rates, and therefore helps assess data quality and provides corrected fertility levels (Zaba 1981; Moultrie 2013) – the Brass P/F Ratio method showed instances throughout the period in which under-reporting and over-reporting of births at certain age categories were visible. The Brass P/F Ratio method, on the other hand, uses the reported average parities of younger age groups as the adjustment factor to determine fertility levels only (Hlabana, 2006; Moultrie 2013).

Table B2 [in Appendix B] shows the values of the application of the Relational Gompertz Model to the UDHS in 1989, 1995, 2000, 2006, and 2011; whilst figures 5.7 (1989), 5.8 (1995), 5.9 (2000), 5.10 (2006) and 5.11 (2011) show the graphical representation of the implied TFRs for each of the adjustment factors used. Reported average parities (CEB) as well as reported recent fertility estimates (ASFRs) for each age category are shown. Furthermore, the table shows the summary estimates of TFR and the TFR estimates for adjustments made using only average parities for age groups 15-19 to 35-39 (2+2 points/CEB2) and age groups 15-19 to 45-49 (3+3 points/CEB3); as well as adjustments made using both average parities and recent fertility estimates for age groups 15-19 to 35-39 (2+2 points/ASFR2) and age groups 15-19 to 45-49 (3+3 points/ASFR3).

In 1989 the reported TFR was 7.386, however dependent on the adjustment factor used, according to the implied TFRs a Ugandan woman in 1989 would have born between 7.318 to 7.906 children by the end of her reproductive life-cycle. The TFR estimates that most resemble the reported TFR are first the adjustment factor ASFR2, followed by ASFR3 – both of which are lower than the reported TFR in 1989. CEB2 and CEB3, the adjustment factors based on only reported children ever born, both show TFRs considerably higher than that of the reported TFR

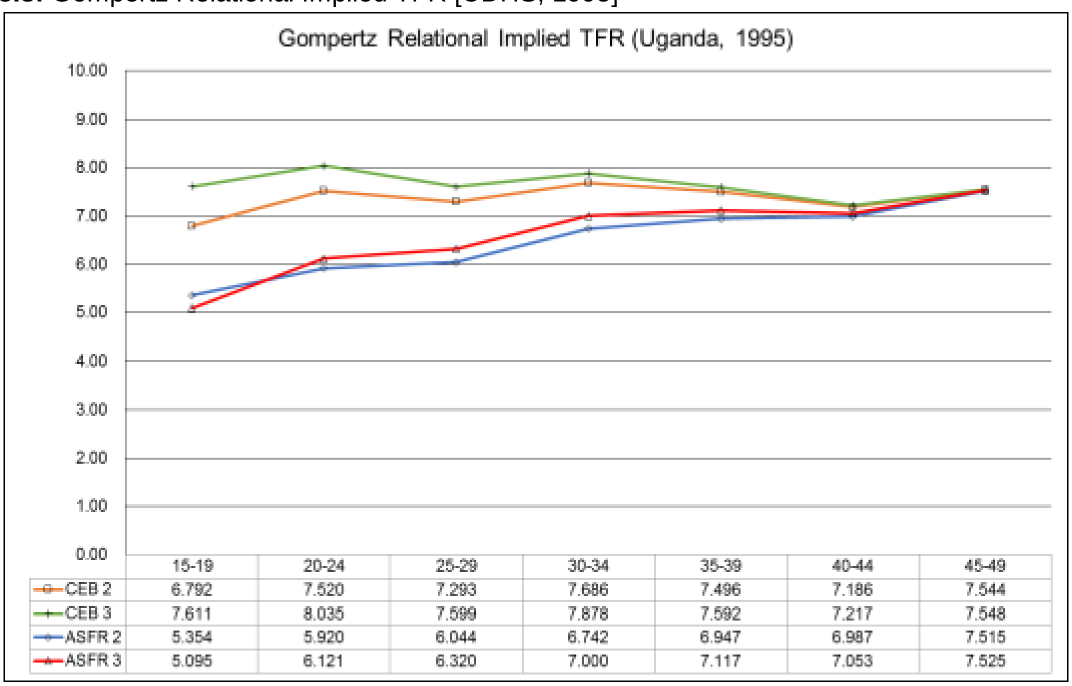
The data for 1995 to 2011 shows much the same pattern as in 1989, whereby the reported TFRs are considerably lower than the implied TFRs using CEB as the adjustment factor (CEB2 and CEB3), but on par with the implied TFR which use both CEB and ASFR in the adjustment factor (ASFR2 and ASFR3). In 2011, on the other hand, all the implied TFRs are higher than the actual reported TFR.

Figure 5.7: Gompertz Relational Implied TFR [UDHS, 1989]



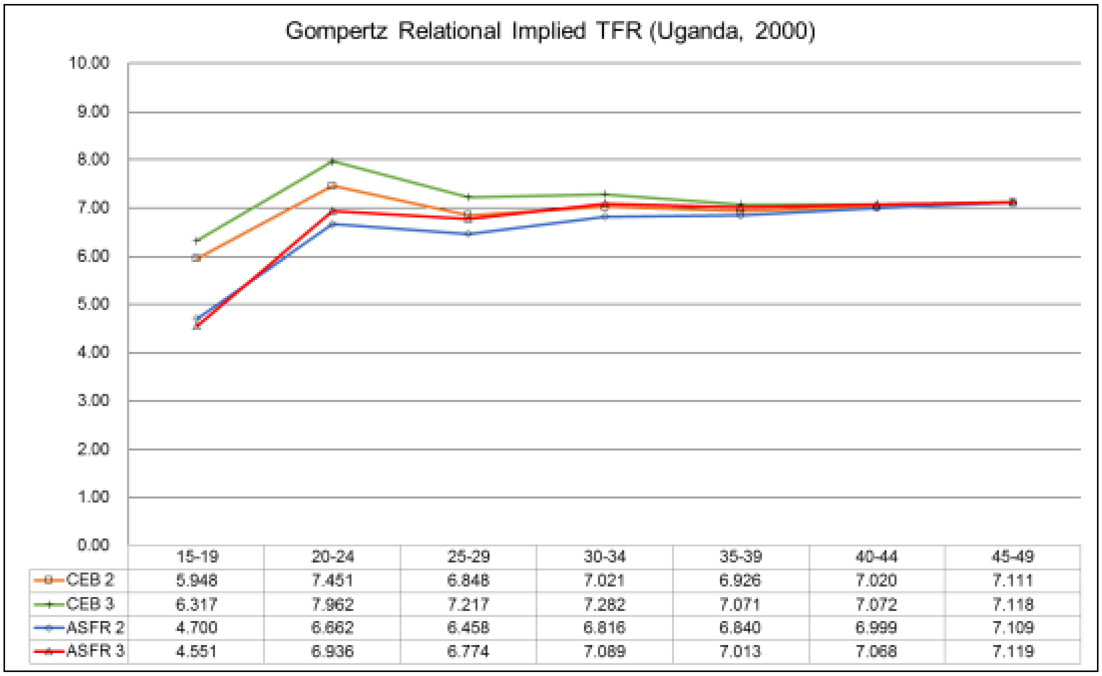
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
CEB 2	8.273	7.905	8.093	7.540	7.957	7.683	7.891
CEB 3	6.698	7.719	8.305	7.814	8.186	7.784	7.908
ASFR 2	5.997	6.942	7.646	7.374	7.912	7.685	7.893
ASFR 3	5.666	6.882	7.680	7.431	7.963	7.708	7.897

Figure 5.8: Gompertz Relational Implied TFR [UDHS, 1995]



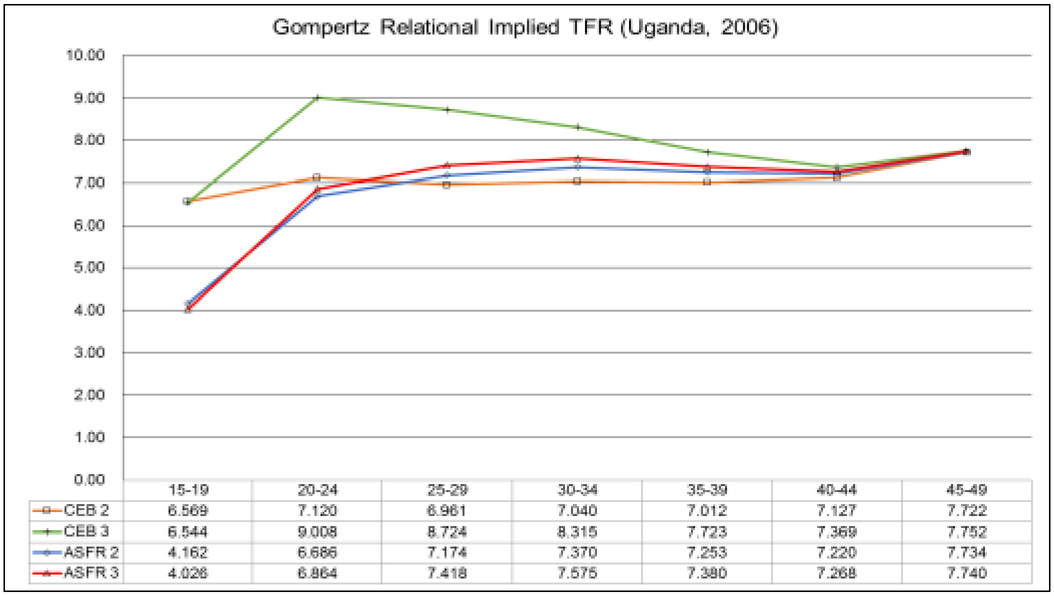
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
CEB 2	6.792	7.520	7.293	7.686	7.496	7.186	7.544
CEB 3	7.611	8.035	7.599	7.878	7.592	7.217	7.548
ASFR 2	5.354	5.920	6.044	6.742	6.947	6.987	7.515
ASFR 3	5.095	6.121	6.320	7.000	7.117	7.053	7.525

Figure 5.9: Gompertz Relational Implied TFR [UDHS, 2000]



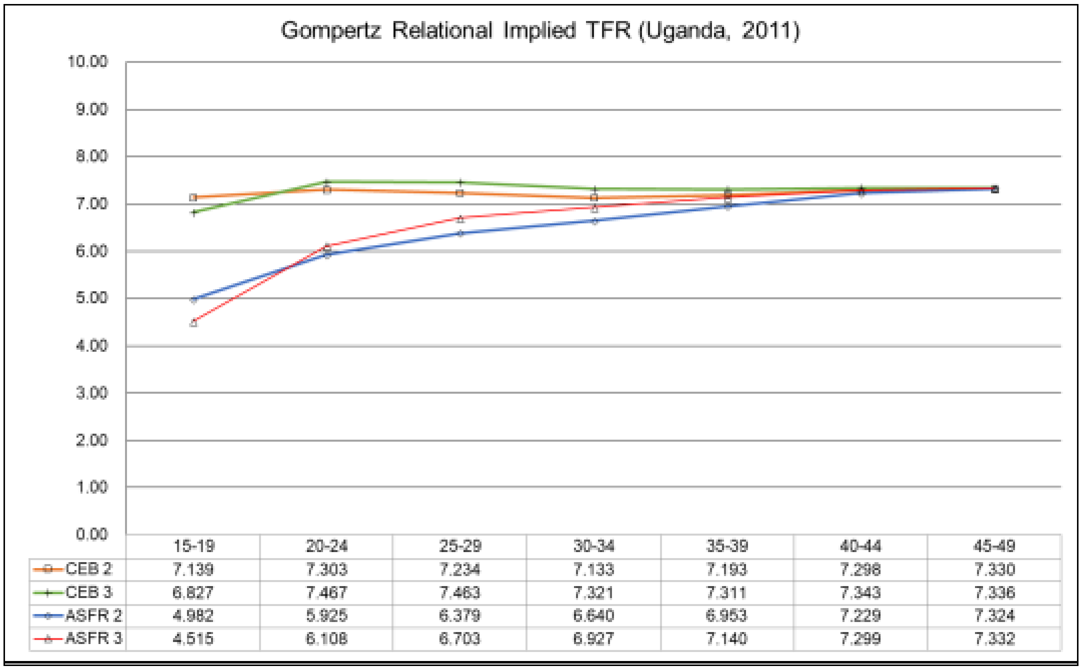
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
CEB 2	5.948	7.451	6.848	7.021	6.926	7.020	7.111
CEB 3	6.317	7.962	7.217	7.282	7.071	7.072	7.118
ASFR 2	4.700	6.662	6.458	6.816	6.840	6.999	7.109
ASFR 3	4.551	6.936	6.774	7.089	7.013	7.068	7.119

Figure 5.10: Gompertz Relational Implied TFR [UDHS, 2006]



	15-19	20-24	25-29	30-34	35-39	40-44	45-49
CEB 2	6.569	7.120	6.961	7.040	7.012	7.127	7.722
CEB 3	6.544	9.008	8.724	8.315	7.723	7.369	7.752
ASFR 2	4.162	6.686	7.174	7.370	7.253	7.220	7.734
ASFR 3	4.026	6.864	7.418	7.575	7.380	7.268	7.740

Figure 5.11: Gompertz Relational Implied TFR [UDHS, 2011]

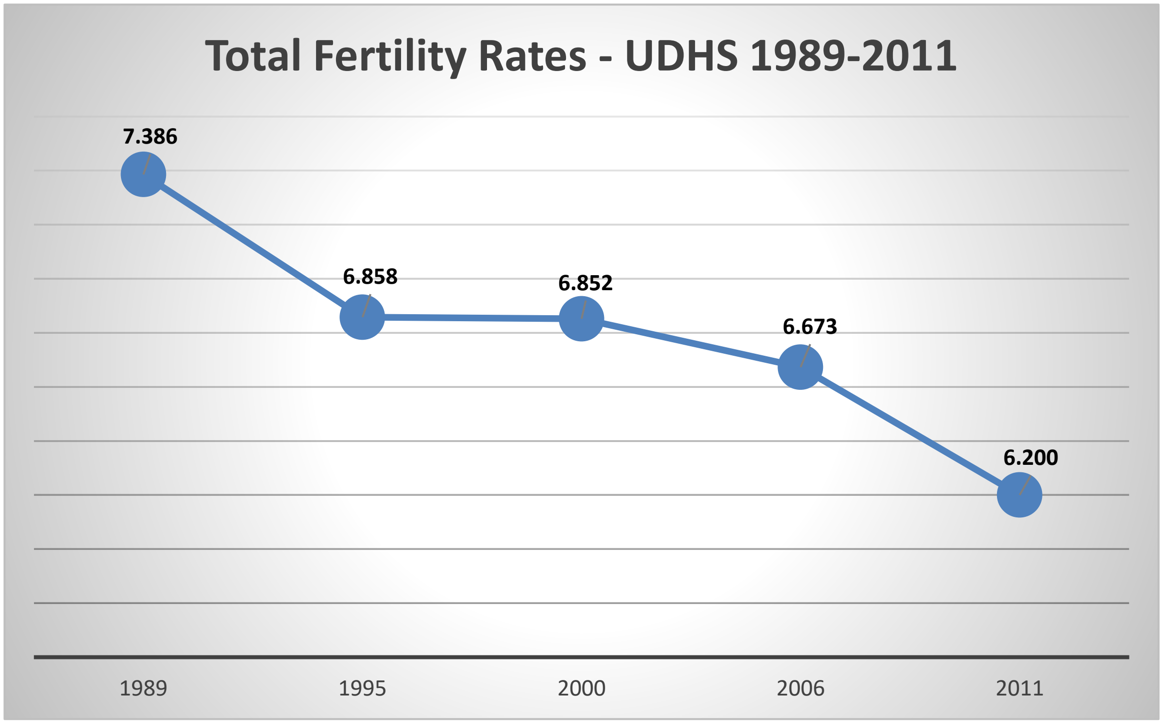


5.3 Fertility Levels and Trends amongst Ugandan Women

The calculated total fertility rate for Uganda from 1989 to 2011 are shown in Figure 5.12 below, whereas results of the estimated TFRs are reported in Table B1 and B2 in Appendix B. For the 1989 figures, the Brass P/F Ratio shows a slightly higher TFR (7.398 per woman) than the reported TFR, whereas the Relational Gompertz Method TFR shows a slightly lower TFR (7.318 per woman). On the other hand, both in 1995 and 2000 both the Brass P/F Ratio (6.448 and 6.616 per woman respectively) and the Relational Gompertz Model (6.604 and 6.650 per woman respectively) TFRs were lower than those reported in both these years. Furthermore, whereas in the reported TFR from 1995 to 2000 the TFR decreased slightly, for both the Brass P/F Ratio and the Relational Gompertz Model TFR's increased slightly from 1995 to 2000. This pattern was again seen from 2000 to 2006, where the reported TFR showed a slight decrease from 6.852 to 6.673 per woman; whereas both the Brass P/F ratio and the Relational Gompertz Model showed somewhat significant increases during the two years.

According to the Brass P/F Ratio the TFR increased from 6.616 in 2000 to 7.286 per woman in 2006; and according to the Relational Gompertz Model the TFR increased from 6.650 in 2000 to 6.896 per woman in 2006. On the other hand, the 2011 TFRs from both the Brass P/F Ratio (6.530 per woman) and the Relational Gompertz Model (6.575 per woman) were slightly higher than the reported TFR for 2011. From the 2006 to 2011 DHS the reported TFR decreased from 6.710 to 6.200 per woman. However, according to the computed TFRs, the decrease seen from 2006 and 2011 was much smaller than the one seen by the reported TFRs. What can be ascertained, though with slight variations in the TFR values between the actual, Brass P/F Ratio and Gompertz Relational is that following an initial drop in fertility, there was a stall in the late 1990s and only a slow resumption of decline in the early 2000s followed by a more rapid decline in the latter half of the 2000s.

Figure 5.12: Total Fertility Rates Estimates in Uganda [UDHS, 1989 - 2011]



5.4 Fertility Differentials amongst Ugandan Women by Socio-Demographic Factors, RH Outcomes and Physical GBV in 2011

As mentioned, fertility levels and trends are shown from 1989 until the 2011 DHS to provide an overview of the levels and trend in fertility amongst Ugandan women. Subsequent analyses and results were conducted for women of reproductive age included in the domestic violence module in the 2011 UDHS only.

According to the direct fertility rates used, the mean CEB for Ugandan women of reproductive age in 2011 was 3.52, while the mean achieved fertility (or otherwise, the mean CEB for those women at the end of their reproductive cycle or aged 44 to 49) rate was 6.93.

5.4.1 Fertility Differentials by Individual Characteristics

Table 5.1 below shows the mean CEB, mean achieved fertility and TFR by the selected individual factors. Muganda women consistently have the lowest fertility rates amongst all ethnic groups. The mean CEB for Muganda women was 2.89, whilst the achieved fertility and TFR were 6.16 and 5.49 respectively. In contrast, whilst Musoga women had the highest mean CEB (4.43) amongst all ethnic groups, Munyankole women had the highest achieved fertility (7.82) and Mukiga women had the highest TFR (12.25) followed by Munyankole women (10.25). The remaining ethnic groups had a mean CEB of between 3.34 and 3.69, an achieved fertility rate of 6.37 to 6.80, and a TFR of 7.05 to 7.81 children per woman.

Women who are members of the SDA religion consistently have the lowest fertility rates – 2.92 mean CEB, 6.29 mean achieved fertility (although Protestant women have a mean achieved fertility of 6.28), and a TFR of 4.88 children per woman. There is little differentiation between the other Christian denominations and Muslim women, although catholic women had a slightly lower mean CEB than Protestant, Muslim and Pentecostal. On the other hand, Protestants had the highest TFR (8.19 children per woman) and Pentecostal women had the highest achieved fertility rates (7.29).

An unsurprising and distinct pattern is seen with all three fertility measures and educational level. For all three fertility measures, the highest rate was amongst those with no education and this decreased with each subsequent increase in educational level. Women with no education had a mean CEB of 5.81, an achieved fertility of 7.81 and a TFR of 9.13. The corresponding values for women who had completed a primary education were

3.76, 6.79 and 7.98; whilst for those who had completed a secondary education these values were 2.10, 5.32 and 6.08. Women with a post-secondary level of education had dramatically lower fertility than those with no, primary and secondary levels of education. The mean CEB amongst women with a higher than secondary education was 1.60; whilst their achieved fertility and TFR were 3.25 and 3.96, respectively.

Although unemployed women had lower mean CEB (2.78) and TFR (6.82) than women who were employed (3.91 and 8.08 respectively), they had a higher achieved fertility (7.35) compared to their employed counterparts (6.73). On the other hand, the lower the age at first cohabitation the higher the fertility rate – this was the case for mean CEB, achieved fertility and TFR measures. Women who had first cohabitated below the age of 15 years had a mean CEB of 5.76, an achieved fertility of 7.98, and a TFR of 8.70. Comparatively, those who had first cohabitated above the age of 25 years had a mean CEB of 3.54, an achieved fertility of 4.60 and a TFR of 5.89. Although, those who had first cohabitated between the ages of 15 and 19, though had lower fertility rates than those who had first cohabitated below the age of 15, the decrease was marginal. These women had a mean CEB of 4.03, an achieved fertility of 7.00 and a TFR of 8.14. The marginal decrease seen between these two age groups may be the effect of the onset of menarche rather than actual age at first cohabitation – given that women are only able to conceive a child once they have begun menarche which may be earlier or later than 15 years of age. However, the risk does remain higher the lower the age at first cohabitation. These rates decrease considerably amongst those who first cohabitated between the ages of 20 to 24 years. Amongst this age mean CEB was 3.50; whilst the achieved fertility and TFR were 6.40 and 7.66 respectively.

Women who were either solely or partly involved in big household decisions, showed a higher mean CEB (4.36) and TFR (8.54) than relationships where women were not involved in these decisions at all (3.35 and 8.37, respectively). On the other hand, women who were involved in decisions in the household had a lower mean achieved fertility rate (7.07) than those in which women were not involved (7.97).

Table 5.1: Fertility Rates of Ugandan Women of Reproductive Age by Individual Level Factors [UDHS, 2011]

	Mean CEB	Achieved Fertility	TFR
Ethnicity			
Muganda	2.89	6.16	5.49
Munyankole	3.36	7.82	10.25
Musoga	4.43	6.80	7.81
Mukiga	3.69	6.37	12.25
Ateso	3.58	6.75	7.05
Other	3.69	7.01	7.47
Religion			
Catholic	3.48	7.12	7.83
Protestant	3.61	6.28	8.19
Muslim	3.65	6.84	6.41
Pentecostal	3.66	7.29	7.85
SDA	2.92	6.29	4.88
Other	4.25	7.00	7.30
Highest Education Level			
No education	5.81	7.81	9.13
Primary	3.76	6.79	7.98
Secondary	2.10	5.32	6.08
Higher	1.60	3.25	3.96
Employment Status			
Not employed	2.78	7.35	6.82
Employed	3.91	6.73	8.08
Age at First Cohabitation			
Under 15 Years	5.76	7.98	8.70
15-19 Years	4.03	7.00	8.14
20-24 Years	3.50	6.40	7.66
25 and Above	3.54	4.60	5.89
Household Decision-Making			
Women Not Involved in Decision-Making	3.35	7.97	8.37
Women Involved in Decision-Making	4.36	7.07	8.54

5.4.2 Fertility Differentials by Household Characteristics

The fertility rates by household characteristics are shown in Table 5.2 below. All three direct fertility rates were lowest amongst those households classified as richest – amongst these women mean CEB was 2.52, mean achieved fertility was 5.29 and TFR was 5.32. respectively; whilst they had the highest mean achieved fertility (6.92). While those classified as poorest had the highest mean CEB (4.24) and mean achieved fertility (7.69), those classified has middle wealth status had the highest TFR (9.02), followed closely by women classified as poorest (8.84). With mean CEB and mean achieved fertility, the fertility rate decreased systematically as the wealth status of the household increased.

While the mean CEB was highest amongst those households where the husband or partner wanted more children than the wife (4.35), the mean achieved fertility was the highest amongst those households where the husband or partner wanted less children than the wife (7.99). On the other hand, households where the husband or partner and wife wanted the same number of children had the highest TFR (8.63); whereas these households had the lowest mean CEB (3.52). Households where the husband wanted more children than the wife had the lowest mean achieved fertility (6.94), but households where the husband wanted less children had the lowest TFR (8.09).

Table 5.2: Fertility Rates of Ugandan Women of Reproductive Age by Relationship Characteristics [UDHS, 2011]

	Mean CEB	Achieved Fertility	TFR
Wealth Status			
Poorest	4.24	7.69	8.84
Poorer	3.98	7.63	8.78
Middle	3.78	7.33	9.02
Richer	3.61	6.38	7.45
Richest	2.52	5.29	5.32
Asymmetry of Desired Number of Children			
Both want the same	3.52	7.03	8.63
Husband wants more	4.35	6.94	8.45

Husband wants less	4.15	7.99	8.09
Don't know	4.30	7.21	8.48

5.4.3 Fertility Differentials by Community Characteristics

Table 5.3 shows the mean CEB, achieved fertility and TF rates of Ugandan women by community-level characteristics. Kampala had the lowest mean CEB (1.91), achieved fertility (4.94) and TFR (3.67) of all regions in Uganda. East Central, on the other hand, had the highest mean CEB (4.25) whilst the North region had the highest achieved fertility rate (8.19). The Southwest region had, by far, the highest TFR (17.41) followed by the Western region (10.03). All other regions had a mean CEB of above 3 children per women, but none reached 4 children per women (except East Central). The Karamoja region had the second lowest achieved fertility (5.08), whilst the remaining regions had achieved fertility rates of between 6.33 and 7.67. Similarly, the remaining regions had TFRs of between 6.20 and 7.73. Furthermore, women living in urban areas had considerably lower mean CEB (2.43), achieved fertility (5.54) and TFR (4.46) than their counterparts living in rural areas (3.82, 7.04 and 8.37 respectively).

All three fertility measures were higher for women living in communities with low percentages of women with secondary or higher educational attainment. Amongst these communities the mean CEB was 4.01, whilst the achieved fertility and TFR were 7.66 and 8.23 respectively. The mean CEB and achieved fertility decreased slightly for women living in communities the medium percentages of women with secondary or higher education, 3.81 and 6.74 respectively. However, the TFR was moderately higher amongst these women 8.26. On the other hand, amongst women living in communities with high percentage of women with secondary or higher education the mean CEB (2.90), achieved fertility (5.45) and TFR (5.74) were dramatically lower.

Women who lived in communities with a high percentage of households classified as richer or higher had the lowest mean CEB (2.90), mean achieved fertility (5.47), and TFR (5.74). Women who lived in communities with low or medium percentage of households classified as richer or richest had either the same, or almost the same, fertility rates.

Women who lived in communities where there were a high percentage of women who experienced less severe GBV consistently had the highest fertility rates. For these women mean CEB was 4.07, mean achieved fertility was 7.60 and TFR was 8.25 children per woman. Those who lived in communities with low percentages of women who had experienced less severe physical GBV also had the lowest fertility rates.

While women who lived in communities in which a high percentage of women had experienced more physical GBV had the highest mean CEB (4.03) and mean achieved fertility (7.56), the highest TFR (8.67) was amongst those women who lived in communities with a medium percentage of women that had experienced more severe physical GBV.

Table 5.3: Fertility Rates of Ugandan Women of Reproductive Age by Community Characteristics [UDHS, 2011]

	Mean CEB	Achieved Fertility	TFR
Region			
Kampala	1.91	4.94	3.67
Central 1	3.46	6.55	6.20
Central 2	3.88	7.67	6.69
East Central	4.25	6.89	7.73
Eastern	3.79	6.94	6.68
North	3.79	8.19	6.67
Karamoja	3.48	5.08	7.72
West-Nile	3.53	7.37	6.64
Western	3.84	7.17	10.03

Southwest	3.34	6.33	17.41
Place of Residence			
Urban	2.43	5.54	4.46
Rural	3.82	7.04	8.37
Community Level of Female Education			
Low	4.01	7.66	8.23
Medium	3.81	6.74	8.26
High	2.72	5.58	6.43
Community Level of Wealth			
Low	3.83	7.35	8.54
Medium	3.83	7.25	8.50
High	2.90	5.47	5.74
Community Level of Less Severe Physical GBV			
Low	3.12	6.03	7.10
Medium	3.53	6.75	8.16
High	4.07	7.60	8.25
Community Level of More Severe Physical GBV			
Low	3.22	6.27	6.97
Medium	3.66	7.03	8.67
High	4.03	7.56	8.19

5.4.4 Fertility Patterns by Reproductive Health Outcomes

The percentage distribution of the three fertility measures by Reproductive Health outcomes are shown in Table 5.4 below. For current contraceptive method, women who were reportedly on no method had a lower mean CEB (3.35) than women on traditional (4.79) and modern methods (4.17). Women on traditional methods had the highest mean CEB. On the other hand, according to the achieved fertility rates women on traditional methods had the lowest rates (6.56), followed by those on no methods (6.79). The highest achieved fertility rates were amongst women on modern contraceptive methods (7.09). The TFR values, on the other hand, show a different pattern altogether. Women who were on no method of contraceptive had the highest TFR (7.96), whilst women on traditional methods had the lowest (7.60). Women on modern contraceptive methods had a TFR of 7.78 children per woman.

Women who had not planned their most pervious birth had a higher mean CEB (4.74), achieved fertility (8.73) and TFR (11.81) compared to women who stated that their most recent birth was planned (3.74, 7.52 and 8.70, respectively). Furthermore, those women who had experienced a termination of pregnancy (either by stillbirth, miscarriage or abortion) also had higher mean CEB (4.88), achieved fertility (7.50) and TF (8.24) rates compared to women who had never experienced a termination of pregnancy (3.22, 6.52 and 7.59 respectively).

Table 5.4: Fertility Rates of Ugandan Women of Reproductive Age by Reproductive Health Outcomes [UDHS, 2011]

	Mean CEB	Achieved Fertility	TFR
Current Contraceptive Method			
No Method	3.35	6.79	7.96
Traditional Method	4.79	6.56	7.60
Modern Method	4.17	7.09	7.78
Intention of Previous Pregnancy			
Birth Not Planned	4.74	8.73	11.81
Birth Planned	3.74	7.52	8.70
Ever Had a Pregnancy Terminated			
No	3.22	6.52	7.59
Yes	4.88	7.50	8.24

5.4.5 Unadjusted Results for Fertility with Physical GBV, RH Outcomes and all Socio-Demographic Factors

Table 5.5 shows the unadjusted Poisson results between children ever born with each form of GBV, the RH outcomes and all the socio-demographic factors. The only factor to not show a significant relationship with children ever born was religion (although SDA was the only category to show a significant result), as well as the medium category in community level of wealth. All other factors and their categories showed significant relationships with children ever born.

The average number of children was 21% higher for women who had experienced less severe GBV and 25% higher for women who had experienced more severe GBV, compared to those that had not.

The unadjusted model for children ever born also showed significant relationships with the three RH outcomes. Those who were on traditional and modern contraceptives had 38% and 22% more children than those who were on no contraceptives, respectively. Those who had ever experienced the termination of a pregnancy had significantly 53% more children than those that did not; whilst those that had planned their previous pregnancy had 19% less children than those who stated that the previous pregnancy was unplanned.

All the individual-level socio-demographic characteristics showed a significant relationship with children ever born as well. According to ethnic category, Munyankole women had 15% more children than Muganda women; whilst Musoga and Mukiga women had 39% and 25% more children. Furthermore, Ateso women and women from the Other ethnic groups had 27% and 25% more children, respectively.

Children ever born decreases with each level of education achieved. Those women with a primary school level of education had 29% less children than women with no education, whilst those with secondary and higher than secondary has 60% and 72% less children. However, those who were employed had 38% (more children than those who stated that they were unemployed. Women who belonged to the SDA religion was the only religious category that showed a significant result, these women had 19% less children than women who belonged to the Catholic religion.

The age at which a woman first cohabitates also shows a significant relationship with children ever born – the lower the age of first cohabitation the higher the children ever born. Those who first cohabitated between the ages of 15 and 19 years had 26% less children, compared to those who first cohabitated below the age of 15 years. Furthermore, those that cohabitated between the ages of 20 and 24 years, and those that were 25 years or older, had 35% and 41% less children those that cohabitate before the age of 15, respectively. Women involved (either solely or in part) in key household decisions had 20% more children ever born, then women who were not involved in such decisions.

All but one category (poorer wealth category) amongst the household-level factors showed a significant relationship with children ever born. Women who were in household classified as middle and richer had 8% and 14% less children than women living in households classified as poorest, respectively. However, women living in households that were classified as the richest households had 40% less children ever born than women living in households classified as the poorest.

Women whose husbands wanted more children than they did had 33% more children ever born than women who had husbands that wanted the same number of children. However, women whose husbands wanted less children than them had 13% more children. The category “Don’t know” (i.e.: did not know whether the husband wanted less, the same or more children than them) was the second highest category – these women had 27% more children than women who had husbands who wanted the same number of children as they did.

Women residing in all regions had significantly more children than women living in the Kampala region. Women living in East Central and Karamoja regions had over 2 times more children than women living in Kampala. Women living in Central 1 and Central 2 had 75% and 98% more children, whilst those in Eastern and North regions had 93% and 87% more children, respectively. Finally, whilst women living in West-Nile and Western region had 82% and 96% more children than women living in Kampala, respectively; women in Southwest region had 68% more children. Closely related, given that Kampala region is a predominantly urban area, women living in rural areas had 52% more children than women living in urban areas.

Women living in communities with medium and high percentages of women with a secondary or higher level of education had 11% and 38% less children than women living in communities where percentages were low.

Although the result for medium in community level of wealth was not significant, those women that lived in communities where there was a high percentage of households classified as richer or richest had 29% less children ever born than women living in communities where the percentage of households classified as richer or richest was low.

In the unadjusted model, community level of less severe and more severe physical GBV showed significant associations with children ever born. Women who lived in communities where the number of women who experienced less and more severe physical GBV was medium had 16% and 15% more children than women who lived in communities where either severity of GBV was low, respectively. Furthermore, where these percentages were high women had 35% and 32% more children compared to women living in communities where these percentages were low, respectively.

Table 5.5: Unadjusted Incidence Risk Ratio of Children Ever Born [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Severity of Physical GBV			
Less Severe Physical GBV			
No	**RC**		
Yes	1.21 *	1.16 - 1.23	0.00
More Severe Physical GBV			
No	**RC**		
Yes	1.25 *	1.19 - 1.32	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.38 *	1.21 - 1.57	0.00
Modern Method	1.22 *	1.16 - 1.29	0.00
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.81 *	0.77 – 0.86	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.53 *	1.45 – 1.61	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	1.15 *	1.04 – 1.27	0.01
Musoga	1.39 *	1.26 – 1.53	0.00
Mukiga	1.25 *	1.12 – 1.40	0.00
Ateso	1.27 *	1.14 – 1.42	0.00
Other	1.25 *	1.16 – 1.34	0.00
Religion			
Catholic	**RC**		
Protestant	0.99	0.93 - 1.04	0.61
Muslim	1.05	0.98 - 1.13	0.16
Pentecostal	1.02	0.95 - 1.10	0.61
SDA	0.81 *	0.66 - 1.00	0.05
Other	1.16	0.89 - 1.51	0.27
Highest Education Level			
No education	**RC**		
Primary	0.71 *	0.67 - 0.75	0.00
Secondary	0.40 *	0.37 - 0.43	0.00
Higher	0.28 *	0.24 - 0.33	0.00
Employment Status			
Not employed	**RC**		
Employed	1.38 *	1.31 – 1.46	0.00
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.74 *	0.70 – 0.79	0.00

20-24 Years	0.65 *	0.61 – 0.70	0.00
25 and Above	0.59 *	0.52 – 0.67	0.00
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.20 *	1.11 – 1.28	0.00
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.97	0.90 - 1.03	0.32
Middle	0.92 *	0.86 - 0.99	0.03
Richer	0.86 *	0.80 - 0.92	0.00
Richest	0.60 *	0.56 - 0.64	0.00
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.33 *	1.24 - 1.42	0.00
Husband wants less	1.13 *	1.01 - 1.26	0.04
Don't know	1.27 *	1.19 - 1.36	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.75 *	1.55 - 1.98	0.00
Central 2	1.98 *	1.76 - 2.22	0.00
East Central	2.15 *	1.92 - 2.42	0.00
Eastern	1.93 *	1.72 - 2.17	0.00
North	1.87 *	1.66 - 2.11	0.00
Karamoja	2.03 *	1.80 - 2.29	0.00
West-Nile	1.82 *	1.62 - 2.05	0.00
Western	1.96 *	1.74 - 2.20	0.00
Southwest	1.68 *	1.49 - 1.89	0.00
Place of Residence			
Urban	**RC**		
Rural	1.52 *	1.44 – 1.61	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.89 *	0.85 - 0.94	0.00
High	0.62 *	0.58 - 0.66	0.00
Community Level of Wealth			
Low	**RC**		
Medium	0.96	0.91 - 1.01	0.12
High	0.71 *	0.67 – 0.76	0.00
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	1.16 *	1.09 - 1.23	0.00
High	1.35 *	1.28 - 1.43	0.00
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	1.15 *	1.08 - 1.21	0.00
High	1.32 *	1.25 - 1.40	0.00

5.5 Fertility Differentials amongst Ugandan Women by Experience of Physical Gender-Based Violence

Given that this study introduces the argument that severity of physical GBV may act as a moderator in exacerbating fertility levels, albeit in different ways and magnitude, it is important to review fertility differentials amongst those that had and had not experienced each severity of physical GBV as well as the associative influence that each severity of GBV had on each of the included RH outcomes and factors. Therefore, this section presents both the unadjusted Odds Ratios (OR) for each severity of physical GBV on the RH outcomes and factors, as well as the fertility differentials comparing those who had and had not experienced each severity of physical GBV.

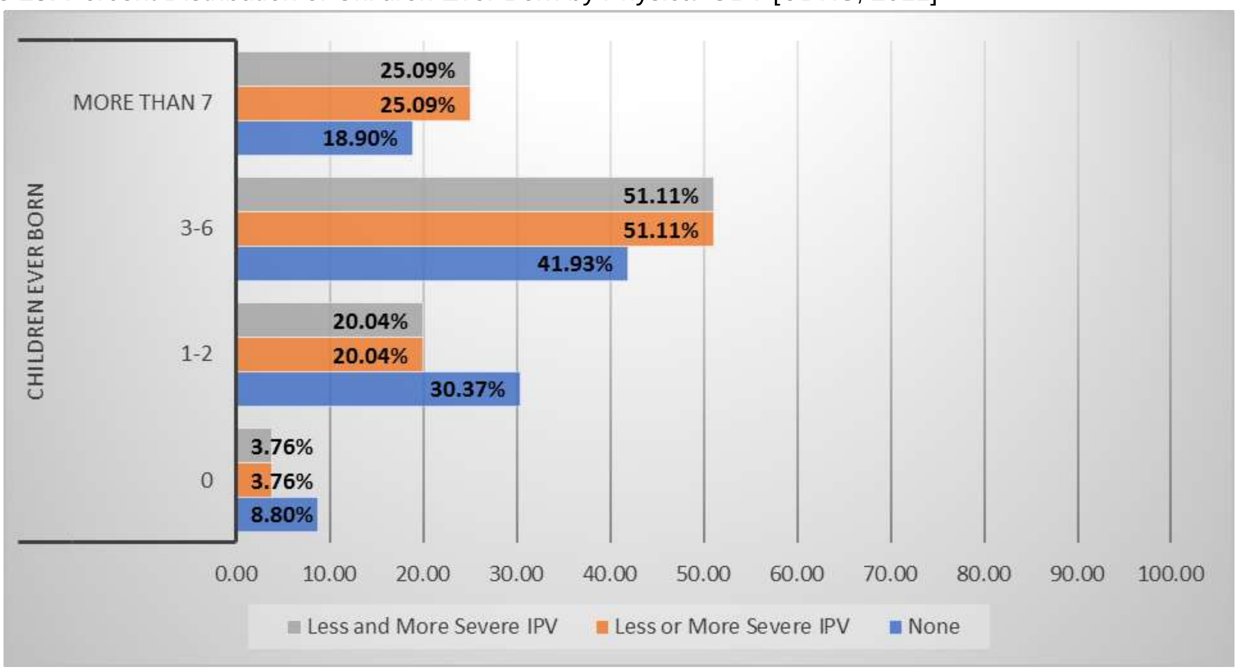
Table 5.6 below shows the three direct fertility measures by severity of physical (both less and more severe) GBV. Women who experienced more severe physical GBV, had higher mean CEB (4.93) and achieved fertility (7.49) values than their counterparts who had not experienced this form of GBV (3.99 and 6.65 respectively). On the other hand, women who had experienced more severe physical GBV had a lower TFR (7.97) than women who had never experienced more severe physical GBV (8.21). On the other hand, women who had ever experienced less severe physical GBV had high mean CEB (4.64), achieved fertility (7.43) and TF rates (8.39) compared to women who had never experienced less severe physical GBV (3.89, 6.44 and 7.92 respectively).

Table 5.6: Fertility Rates of Ugandan Women of Reproductive Age by Less and More Physical GBV [UDHS, 2011]

	Mean CEB	Achieved Fertility	TFR
Less Severe Physical GBV			
No	3.89	6.44	7.92
Yes	4.64	7.43	8.39
More Severe Physical GBV			
No	3.99	6.65	8.21
Yes	4.93	7.49	7.97

Of women who experienced both less and more severe physical GBV or less or more severe physical GBV (Figure 5.13) 25.09% had 7 or more children, whilst 51.11% had between 3 and 6 children. Furthermore, 20.04% had between 1 and 2 children, and the lowest percentage (3.76%) had no children.

Figure 5.13: Percent Distribution of Children Ever Born by Physical GBV [UDHS, 2011]



In the unadjusted model for less severe physical GBV, the RH outcome current contraceptive use was not significant to less severe physical GBV (Table 5.7). However, intention of previous pregnancy and ever had a pregnancy terminated was. Women who planned their previous pregnancy were 24% less likely to have experienced less severe physical GBV; whilst women who had experienced the termination of a pregnancy were 55% more likely.

All ethnic categories were more likely than Muganda women to experience less severe physical GBV. Musoga women were 66% more likely, whilst Munyankole and Mukiga women were 96% and 93% more likely, respectively. On the other hand, Ateso women were over 5 times more likely to experience less severe physical GBV than Muganda women, and women in smaller ethnic groups classified as “other” were 2 times more likely. Furthermore, only Protestant and Muslim women showed a significant result with less severe physical GBV, compared to Catholic women. Protestant women were 18% less likely to experienced less severe physical GBV than Catholic women, and Muslim women were 38% less likely.

Whilst primary level of educational status did not show a significant result, women who had a secondary level of education were 54% less likely to experience less severe physical GBV, whilst those with higher than secondary were 79% less likely, compared to women with no education. Furthermore, women who first cohabitated at age 20-24 years and 25 years and older were 58% and 59% less likely to experience less severe physical GBV than woman who had first cohabitated below the age of 15.

Neither the individual-level factors of employment status and household-decision making by the woman showed significant results with less severe physical GBV.

Amongst the household-level factors, whilst those in the poorer households did not have a significant result, those women living in households classified as middle wealth status and above did. Women in households of middle wealth status were 30% less likely to experience less severe physical GBV, whilst those in richer and richest households were 50% and 68% less likely, respectively. Asymmetry of desired number of children showed that those women whose husbands wanted more children than they did had a 75% higher likelihood of experiencing less severe physical GBV than women whose husbands wanted the same number of children. Women whose husbands wanted less children than they did had a 81% higher likelihood, whilst those that did not know whether husbands wanted less / the same / more children had a 34% higher likelihood, of experiencing less severe physical GBV than women whose husbands wanted to the same number of children as they did.

Women living in 6 out the 9 regions showed a significantly higher likelihood of experiencing less severe physical GBV than women living in the Kampala region, a predominantly urban region. Women in rural areas were 55% more likely to experience less severe physical GBV than women living in urban areas. Women living in the East and North regions were over 3 times more likely to experience less severe physical GBV, and women living in the West-Nile were over 2 times more likely to experience less severe physical GBV, than women living in the Kampala region. Furthermore, women living in the East Central, Karamoja and Western regions 77%, 90% and 80% more likely to experience less severe physical GBV than women living in the Kampala region.

All of the computed community level factors showed significant ORs. Women who lived in communities with medium and high percentages of women with a secondary or high level of education were 26% and 59% less likely to experience less severe physical GBV compared to women living in communities with low percentages of women with a secondary or high level of education. Furthermore, women living in communities with a medium and high percentage of households that were classified as richer or richest had a 21% and 58% less likelihood of experiencing less severe physical GBV than women living in communities where these percentages were low.

Finally, women living in communities where the percentage of women who experienced less severe physical GBV was medium or high were themselves over 4 times and over 12 times more likely to experience less severe physical GBV, respectively. Further, women living in communities where the percentage of women who experienced more severe physical GBV was medium or high were themselves over 2 times and over 4 times more likely to experience less severe physical GBV, compared to women living in communities with low percentages of women who experience more severe physical GBV.

Table 5.7: Unadjusted Odds Ratios of Less Severe Physical GBV [UDHS, 2011]

	Less Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.67	0.36 - 1.25	0.21
Modern Method	0.82	0.65 - 1.04	0.10
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.76 *	0.61 - 0.96	0.02
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.55 *	1.24 - 1.94	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	1.96 *	1.27 - 3.03	0.00
Musoga	1.66 *	1.06 - 2.60	0.03
Mukiga	1.93 *	1.18 - 3.15	0.01
Ateso	5.19 *	3.16 - 8.51	0.00
Other	2.60 *	1.90 - 3.57	0.00
Religion			
Catholic	**RC**		
Protestant	0.72 *	0.57 - 0.91	0.01
Muslim	0.62 *	0.45 - 0.84	0.00
Pentecostal	0.92	0.68 - 1.25	0.59
SDA	0.56	0.24 - 1.31	0.18
Other	0.79	0.26 - 2.44	0.68
Highest Education Level			

No education	**RC**		
Primary	0.96	0.75 - 1.23	0.75
Secondary	0.46 *	0.33 - 0.64	0.00
Higher	0.21 *	0.11 - 0.41	0.00
Employment Status			
Not employed	**RC**		
Employed	0.92	0.74 - 1.15	0.46
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.80	0.61 - 1.05	0.11
20-24 Years	0.42 *	0.30 - 0.58	0.00
25 and Above	0.41 *	0.24 - 0.70	0.00
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.08	0.82 - 1.43	0.58
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.85	0.63 - 1.14	0.28
Middle	0.70 *	0.51 - 0.95	0.02
Richer	0.50 *	0.37 - 0.69	0.00
Richest	0.32 *	0.24 - 0.43	0.00
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.75 *	1.32 - 2.33	0.00
Husband wants less	1.81 *	1.17 - 2.79	0.01
Don’t know	1.34 *	1.05 - 1.84	0.02
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.16	0.71 - 1.89	0.56
Central 2	1.12	0.69 - 1.82	0.66
East Central	1.77 *	1.11 - 2.82	0.02
Eastern	3.72 *	2.36 - 5.87	0.00
North	3.46 *	2.16 - 5.50	0.00
Karamoja	1.90 *	1.18 - 3.08	0.01
West-Nile	2.12 *	1.33 - 3.39	0.00
Western	1.80 *	1.12 - 2.89	0.02
Southwest	1.55	0.98 - 2.47	0.06
Place of Residence			
Urban	**RC**		
Rural	1.55 *	1.23 - 1.96	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.74 *	0.59 - 0.92	0.01
High	0.41 *	0.32 - 0.53	0.00
Community Level of Wealth			
Low	**RC**		
Medium	0.79 *	0.63 - 0.99	0.04
High	0.42 *	0.33 - 0.54	0.00
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	4.08 *	3.04 - 5.47	0.00
High	12.94 *	9.72 - 17.35	0.00
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	2.19 *	1.71 - 2.81	0.00
High	4.17 *	3.26 - 5.32	0.00

Table 5.8 below shows the results of the unadjusted analysis for more severe physical GBV. Current contraceptive use did now show a significant association with more severe physical GBV; however, the other 2 RH outcomes did. Women who had planned their previous pregnancy were 25% less likely to experience more severe physical GBV than women who had not, and women who had experienced a termination of pregnancy were 61% more likely to experience more severe physical GBV than those who had not.

While Ateso women and women in the “other” ethnic categories were over 2 times more likely to experience more severe physical GBV, women from the Munyankole ethnic tribe were 77% more likely, compared to women from the Muganda tribe. Furthermore, women in the Protestant and Muslim religions were 34% and 47% less likely to experience more severe physical GBV than women from the Catholic religion.

Women who had completed their primary, secondary and higher than secondary education were 25%, 69% and 85% less likely to experience more severe physical GBV than women who had no education at all. Furthermore, women who had first cohabitated at the ages of 15-19 years 35% less likely to experience more severe physical GBV than women who had first cohabitated below the age of 15 years. Furthermore, women who first cohabitated between the ages of 20-24 years and those that first cohabitated at age 25 or older were 63% and 64% less likely to experience more severe physical GBV than women who had first cohabitated below the age of 15.

Amongst the household factors, those women living in the middle, richer and richest households were 43%, 49% and 71% less likely to experience more severe physical GBV than women living in the poorest households. Furthermore, women whose husbands wanted more children than they did were 2.15 times more likely to experience more severe physical GBV than women whose husbands wanted to same number of children as they did. Women whose husbands wanted less children than they did and those women who did not know were 83% and 93% more likely to experience more severe physical GBV than women whose husbands wanted the same number of children as they did.

Only women living in the Central 2 and Southwest regions did not show significant results. However, women living in the North region were over 5 times more likely to experience more severe physical GBV than women living in the Kampala region. Furthermore, women living in the Eastern, Karamoja and West-Nile were all 3 times more likely, while women living in the East Central and Western regions were over 2 times more likely, to experience more severe physical GBV than women living in the Kampala region. Finally, women living in the Central 1 region were 92% more likely to experience more severe physical GBV than women living in Kampala. Correspondingly, women living in rural areas were 58% more likely to experience more severe physical GBV than women living in urban areas.

Amongst the computed community level factors, for the unadjusted model, women living in communities where a high percentage of women had a secondary or higher level of education had 60% less likelihood of experiencing more severe physical GBV than women living in communities were this percentage was low. Furthermore, women living in communities were percentage of households classified as richer or richest were medium and high were 30% and 58% less likely to experience more severe physical GBV than women living in communities where this percentage was low, respectively.

Finally, women living in communities which had a medium percentage of women experience less and more severe physical GBV were 2.84 and 5.83 times more likely to experience more severe physical GBV than women living in communities where these percentages were low, respectively. Correspondingly, women living in communities with high percentages of women who experienced less and more severe physical GBV were 5.54 and 15.83 times more likely to experience more severe physical GBV themselves, than women living in communities in which these percentages were low.

Table 5.8: Unadjusted Odds Ratios of More Severe Physical GBV [UDHS, 2011]

	More Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.79	0.38 - 1.65	0.53
Modern Method	0.89	0.67 - 1.16	0.38
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.75 *	0.58 - 0.98	0.04
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.61 *	1.25 - 2.07	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	1.77 *	1.05 - 3.01	0.03
Musoga	0.95	0.51 - 1.74	0.86
Mukiga	1.35	0.73 - 2.52	0.34
Ateso	2.09 *	1.17 - 3.75	0.01
Other	2.48 *	1.68 - 3.65	0.00
Religion			
Catholic	**RC**		
Protestant	0.66 *	0.50 - 0.88	0.00
Muslim	0.53 *	0.37 - 0.78	0.00
Pentecostal	0.71	0.49 - 1.02	0.06
SDA	0.35	0.10 - 1.18	0.09
Other	0.49	0.11 - 2.22	0.35
Highest Education Level			
No education	**RC**		
Primary	0.75 *	0.57 - 0.99	0.05
Secondary	0.31 *	0.21 - 0.47	0.00
Higher	0.15 *	0.06 - 0.39	0.00
Employment Status			
Not employed	**RC**		
Employed	0.95	0.73 - 1.23	0.71
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.65 *	0.48 - 0.87	0.00
20-24 Years	0.37 *	0.25 - 0.54	0.00
25 and Above	0.36 *	0.19 - 0.70	0.00

Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	0.93	0.67 - 1.30	0.68
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.75	0.54 - 1.03	0.08
Middle	0.57 *	0.40 - 0.81	0.00
Richer	0.51 *	0.36 - 0.73	0.00
Richest	0.29 *	0.20 - 0.41	0.00
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	2.15 *	1.49 - 3.10	0.00
Husband wants less	1.83 *	1.06 - 3.15	0.03
Don't know	1.93 *	1.34 - 2.77	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.92 *	1.00 - 3.70	0.05
Central 2	1.77	0.92 - 3.41	0.09
East Central	2.09 *	1.11 - 3.97	0.02
Eastern	3.10 *	1.69 - 5.69	0.00
North	5.31 *	2.90 - 9.73	0.00
Karamoja	3.23 *	1.72 - 6.04	0.00
West-Nile	3.72 *	2.02 - 6.87	0.00
Western	2.20 *	1.16 - 4.18	0.02
Southwest	1.86	0.98 - 3.53	0.06
Place of Residence			
Urban	**RC**		
Rural	1.58 *	1.18 - 2.10	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.80	0.62 - 1.03	0.09
High	0.40 *	0.29 - 0.54	0.00
Community Level of Wealth			
Low	**RC**		
Medium	0.70 *	0.54 - 0.92	0.01
High	0.42 *	0.31 - 0.57	0.00
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	2.84 *	2.01 - 4.03	0.00
High	5.54 *	4.01 - 7.66	0.00
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	5.83 *	3.94 - 8.63	0.00
High	15.83 *	10.88 - 23.03	0.00

5.5.1 Fertility Differentials by Less Severe Physical Gender-Based Violence

Amongst the clear majority of RH outcomes and socio-demographic factors, women who had experienced less severe physical GBV had higher mean CEB, mean achieved fertility and TF rates than their counterparts who did not experience less severe physical

GBV (Table 5.9). The few exceptions included the TFR for women who were on no method of contraceptives (7.90), had never experienced the termination of a pregnancy (7.57), and were not employed (7.78) but who had experienced less severe physical GBV. Amongst these women, the TFR was lower than those who had not experienced less severe physical GBV (7.92, 7.92 and 7.78 respectively). Furthermore, women who had a higher than secondary level of schooling (1.63) and who lived in urban areas (3.11), but who had experienced less severe physical GBV, all had lower mean CEBs than those that had experienced less severe physical GBV (2.42 and 3.13), respectively.

There were also a handful of sub-groups that showed a decrease in the mean achieved fertility amongst women who had experienced less severe physical GBV, compared to women that had not. Women of Mukiga ethnicity and who had experienced less severe physical GBV had a mean CEB of 5.58, compared to 6.79 amongst those that did not experienced less severe physical GBV. As with the mean CEB, women that experienced less severe physical GBV and women had a higher than secondary educational level had a lower mean achieved fertility (2.66) than women in the same educational category that had not experienced less severe physical GBV (3.41). Furthermore, women who had first cohabitated below the age of 15 and women that were not involved in household decisions at all had lower mean achieved fertility if they had experienced less severe physical GBV (7.42 and 7.59 respectively) compared to those that did not experience less severe physical GBV (8.53 and 8.44, respectively).

For all three first measures, those that were in the richest wealth quintile and who had experienced less severe physical GBV had lower fertility than those who had not –

although between mean CEB and TFR the difference was marginal. For mean achieved fertility, on the other hand, those that were in households classified as the richest quintile and who did not experience less severe GBV had a mean achieved fertility of 5.35, compared to 4.95 amongst those who had experienced less severe physical GBV in their lifetime.

Finally, women who lived in the North and Western regions and who experienced less severe physical GBV had lower mean achieved fertility than those that had not (8.01 vs 8.44 and 6.95 vs. 7.33, respectively). Furthermore, women living in urban areas but who experienced less severe physical GBV also had a lower mean achieved fertility rate (5.33) compared to urban dwellers who had not experienced this form of GBV (5.69).

Table 5.9: Fertility Differentials of Ugandan Women of Reproductive Age by Less Severe Physical GBV [UDHS, 2011]

Less Severe Physical GBV	Mean CEB		Achieved Fertility		TFR	
	No	Yes	No	Yes	No	Yes
Current Contraceptive Use						
No Method	3.71	4.57	6.37	7.39	7.92	7.90
Traditional Method	4.41	6.62	6.21	6.98	7.87	8.36
Modern Method	4.33	4.67	6.70	7.71	7.85	8.16
Intention of Previous Pregnancy						
Birth Not Planned	4.68	5.13	8.44	8.97	8.57	9.01
Birth Planned	3.57	4.07	7.39	7.67	8.07	8.45
Ever Had a Pregnancy Terminated						
No	3.68	4.41	5.98	7.31	7.92	7.57
Yes	4.64	5.21	7.40	7.68	7.80	8.57
Ethnicity						
Muganda	3.61	4.09	5.87	7.06	7.68	7.76
Munyankole	3.76	4.35	7.22	8.53	8.05	8.53
Musoga	4.71	5.29	6.23	7.85	7.92	8.26
Mukiga	4.14	4.62	6.79	5.58	8.17	8.67
Ateso	3.83	4.59	6.54	7.69	7.80	8.31
Other	3.83	4.71	6.50	7.48	7.80	7.85
Religion						
Catholic	3.58	4.68	6.62	7.61	7.92	8.01
Protestant	4.14	4.63	5.97	7.06	7.87	8.29
Muslim	4.01	4.45	6.12	8.12	7.89	8.01
Pentecostal	4.16	4.62	7.30	7.36	7.89	8.25
SDA	3.00	4.65	6.17	6.33	7.90	8.33
Other	4.20	5.00	7.00	-	7.90	8.40
Highest Education Level						
No education	5.62	6.47	7.75	7.87	8.12	8.58
Primary	4.03	4.52	6.22	7.45	7.96	8.09

Secondary	2.81	3.05	5.52	6.06	7.64	7.84
Higher	2.42	1.63	3.41	2.66	7.77	8.03
Employment Status						
Not employed	3.38	4.50	7.28	7.48	7.78	7.78
Employed	4.07	4.68	6.32	7.41	7.93	8.10
Age at First Cohabitation						
Under 15 Years	5.72	5.82	8.53	7.42	8.06	8.36
15-19 Years	3.78	4.34	6.59	7.46	7.99	8.30
20-24 Years	3.23	4.22	5.75	7.56	7.94	8.20
25 and Above	2.87	5.24	2.69	7.04	7.95	8.21
Household Decision-Making						
Women Not Involved in Decision-Making	3.00	3.91	8.44	7.59	8.09	8.24
Women Involved in Decision-Making	4.04	4.87	6.56	7.02	8.18	8.39
Wealth Status						
Poorest	4.19	5.10	6.87	8.42	7.99	8.46
Poorer	4.12	4.79	7.12	7.54	8.00	8.48
Middle	4.17	4.62	6.64	8.28	8.07	8.44
Richer	4.17	4.86	6.33	6.44	7.86	8.05
Richest	3.20	3.18	5.35	4.95	7.53	7.50
Asymmetry for Desired Number of Children						
Both want the same	3.18	4.20	6.83	7.27	8.03	8.40
Husband wants more	4.18	4.59	6.67	7.36	8.09	8.32
Husband wants less	3.57	4.91	6.47	8.91	7.96	8.31
Don’t know	3.91	4.85	6.51	7.89	8.10	8.32
Region						
Kampala	2.57	2.63	4.86	5.19	7.69	7.90
Central 1	3.82	4.69	6.14	7.69	7.84	8.06
Central 2	4.31	5.26	7.04	8.67	7.77	8.15
East Central	4.52	5.01	6.39	7.04	7.93	8.25
Eastern	3.76	4.75	6.79	7.46	7.68	8.17
North	3.99	4.60	8.44	8.01	7.85	8.17
Karamoja	2.98	5.55	3.17	9.62	7.93	8.33
West-Nile	3.58	4.73	6.27	8.04	7.87	8.26
Western	4.48	4.50	7.33	6.95	8.13	8.50
Southwest	3.74	4.46	6.29	6.57	8.34	8.85
Place of Residence						
Urban	3.15	3.11	5.69	5.33	7.50	7.61
Rural	4.07	4.85	6.60	7.64	8.09	8.21
Community Level of Female Education						
Low	3.97	4.94	7.18	8.05	8.06	8.19
Medium	4.33	4.68	6.78	6.93	7.92	8.32
High	3.35	3.75	5.27	6.70	7.62	7.69
Community Level of Wealth						
Low	3.86	4.80	7.10	7.80	7.93	8.48
Medium	4.06	4.93	6.88	7.63	8.14	8.21
High	3.74	3.56	5.41	5.64	7.50	7.52
Community Level of Less Severe Physical GBV						
Low	3.87	4.32	5.87	7.74	7.68	7.81
Medium	3.89	4.56	6.30	7.23	7.97	8.15
High	3.94	4.73	8.32	7.52	7.97	8.36
Community Level of More Severe Physical GBV						
Low	3.88	4.21	5.95	7.22	7.60	7.71
Medium	3.86	4.80	6.96	7.08	8.14	8.29
High	3.98	4.77	7.38	7.95	7.88	8.33

5.5.2 Fertility Differentials by More Severe Physical Gender-Based Violence

Amongst all RH outcomes and socio-demographic factors, women that had experienced more severe physical GBV had higher mean CEB than those that did not (Table 5.10). The only two exceptions to this were amongst women with higher than secondary educational level and women that were not involved in household decision-making. Amongst these groups of women, those that had experienced more severe physical GBV had lower mean CEB than those who did not experience this form of GBV (1.43 vs. 2.39 and 4.04 vs. 5.12, respectively).

Furthermore, although most mean achieved fertility rates are higher amongst those that experience more severe physical GBV, there are several sub-groups which showed a decrease in the mean achieved fertility rate amongst those that experienced more severe physical GBV. Women that had not planned their previous pregnancy and women who had experienced the termination of a pregnancy, and who experienced more severe physical GBV, had lower mean achieved fertility than those that did not experience this form of GBV (8.57 vs. 8.85 and 7.45 vs. 7.57, respectively). Mukiga women who experienced more severe physical GBV were the only ethnic group that showed a lower mean achieved fertility amongst those that had experienced more severe physical GBV (5.83), compared to those that had not (6.50). The same was true for educational status, in that women with a secondary level of education who experienced more severe physical GBV had a lower mean achieved fertility (4.79) than those that did not (5.79). Furthermore, women who lived in communities with a low percentage of women with secondary or higher education and who experienced more severe physical GBV had a TFR of 8.20, compared to 8.08 amongst those that had not experienced more severe physical GBV.

Women who were not employed and women who had first cohabitated below the age of 15, and who had experienced more severe physical GBV, had lower mean achieved fertility than those that had not experienced more severe physical GBV (7.33 vs. 7.43 and 7.68 vs. 8.16, respectively). As with the pattern seen in less severe physical GBV, women from the East Central and Western regions, and women from urban areas but who had experienced more severe physical GBV all had lower mean achieved fertility rates than their counterparts that had not experienced more severe physical GBV. Finally, women living in communities with a medium percentage of women who experienced more severe GBV, but whom themselves did not experience more severe GBV had a higher mean achieved fertility (7.11) than those who lived in these communities but did experience more severe GBV (6.88).

On the other hand, most sub-groups showed a decrease in the TFR amongst those that experienced more severe physical GBV compared to those that did not. However, the TFR was higher for those that had experienced more severe physical GBV, irrespective of whether they had planned their previous pregnancy or not, compared to women who had not experienced more severe physical GBV. Women who had experienced a termination of pregnancy and experienced more severe physical GBV (8.31) also had a higher TFR than those that had not experienced this form of GBV (8.08).

Whilst most ethnic groups showed a lower TFR for those that had experienced more severe physical GBV, amongst Munyankole (8.45) and Mukiga (8.62) women the TFR was higher for those that experienced more severe physical GBV compared to those that had not (8.19 and 8.32, respectively). Furthermore, of all the religions, only those from the Pentecostal religion showed a higher TFR amongst those who had experienced more severe physical GBV (8.16) compared to those who had not (8.02).

Also, women with no education and women who were employed and who had experienced more severe physical GBV had higher TFRs compared to their counterparts who had not experienced more severe physical GBV (8.52 vs. 8.24 and 8.06 vs. 7.97, respectively). Women who were involved in household decisions (8.40), and who experienced more severe physical GBV, also had a higher TFR than those that did not experience this form of GBV (8.18). Furthermore, those women who lived in households where the partner wanted more children than they did and who experienced more severe physical GBV had a higher TFR (8.24) compared to those who did not experience more severe GBV (8.16). Yet the TFR was higher amongst those who had not experienced more severe GBV, compared to those who had, whose partners wanted the same or less children, and those where this was not known.

Although women living in households of the poorest, poor and middle wealth quintiles and who had experienced more severe physical GBV had higher TFRs than those that did not, the reverse is true amongst those of the richer and richest quintiles.

Women living in the Western and Southwest regions as well as rural dwellers also showed higher TFRs amongst those that had experienced more severe physical GBV compared to those that had not. Women who lived in communities where percentage of females with secondary or higher education was low and who had experienced more severe physical GBV had a higher TFR (8.20) than those who had not (8.08). The versa was true amongst those who lived in communities where the percentage of women with secondary or higher education was medium and high.

Furthermore, although women living in communities where the percentage of households classified as richer or richest was low and medium, but whom experienced more severe GBV had higher TFRs than those that had not – those that lived in communities where the percentage of wealthy households were high, and who experienced more severe GBV, had a lower TFR (6.81) compared to those that did not experience this severity of GBV (7.93).

Amongst the community variables for prevalence of GBV levels, women who had experience more severe GBV but whom lived in communities where the percentage of women who experience less severe GBV was high had a slightly higher TFR than those who did not experience more severe GBV. The opposite was seen in women who lived in communities with low and medium percentages of women who experienced less severe GBV. Finally, while women living in communities with low percentages of women who had experienced more severe physical GBV, but whom themselves experienced more severe physical GBV had a lower TFR (7.28) than those who did not (7.97) – those that lived in communities where these percentages were medium and high had higher TFRs compared to women living in these communities but who did not experience more severe physical GBV themselves.

Table 5.10: Fertility Differentials of Ugandan Women of Reproductive Age by More Severe Physical GBV [UDHS, 2011]

More Severe Physical GBV	Mean CEB		Achieved Fertility		TFR	
	No	Yes	No	Yes	No	Yes
Current Contraceptive Use						
No Method	3.82	4.95	6.56	7.50	7.97	7.84
Traditional Method	4.70	7.34	6.18	7.79	8.19	7.92
Modern Method	4.40	4.64	7.03	7.38	8.05	7.93
Intention of Previous Pregnancy						
Birth Not Planned	4.75	5.28	8.85	8.57	8.35	9.52
Birth Planned	3.59	4.53	7.16	8.32	8.21	8.28
Ever Had a Pregnancy Terminated						
No	3.79	4.67	6.28	7.52	7.92	7.56
Yes	4.68	5.45	7.57	7.45	8.08	8.31
Ethnicity						
Muganda	3.64	4.26	6.02	7.16	8.01	7.13
Munyankole	3.91	4.32	7.71	8.17	8.19	8.45
Musoga	4.75	5.81	6.59	7.55	8.15	7.98
Mukiga	4.21	4.84	6.50	5.83	8.32	8.62
Ateso	3.80	5.64	6.21	9.36	8.11	7.85
Other	3.97	4.97	6.83	7.35	8.00	7.55
Religion						
Catholic	3.73	5.03	6.89	7.89	8.07	7.78
Protestant	4.26	4.57	6.07	7.65	8.02	8.16
Muslim	3.97	5.21	6.75	7.26	8.15	7.52
Pentecostal	4.20	4.60	7.29	7.44	8.13	7.89
SDA	3.44	5.16	6.06	7.00	8.21	7.82
Other	4.16	5.86	7.00	-	8.20	7.80
Highest Education Level						
No education	5.74	6.64	7.77	7.89	8.24	8.52
Primary	4.12	4.64	6.53	7.45	8.03	8.02
Secondary	2.83	3.33	5.79	4.79	8.00	7.18
Higher	2.39	1.43	3.11	4.54	8.10	7.38
Employment Status						
Not employed	3.61	4.63	7.43	7.33	8.02	7.32
Employed	4.12	5.03	6.50	7.53	7.97	8.06
Age at First Cohabitation						
Under 15 Years	5.53	6.38	8.16	7.68	8.23	8.17
15-19 Years	3.88	4.53	6.85	7.40	8.19	8.08
20-24 Years	3.39	4.10	6.13	7.50	8.13	7.90
25 and Above	3.10	6.25	3.58	7.29	8.17	7.86
Household Decision-Making						
Women Not Involved in Decision-Making	5.12	4.04	7.95	8.07	8.26	7.92
Women Involved in Decision-Making	4.78	5.36	6.73	8.06	8.18	8.40
Wealth Status						
Poorest	4.37	5.29	7.09	8.47	8.15	8.33
Poorer	4.20	5.09	7.46	7.94	8.18	8.30
Middle	4.25	4.80	7.42	8.07	8.19	8.36
Richer	4.31	4.89	6.64	5.66	8.10	7.69
Richest	3.13	3.74	5.23	5.72	7.93	6.73
Asymmetry for Desired Number of Children						
Both wants the same	3.36	4.47	6.73	8.36	8.29	8.07
Husband wants more	4.16	5.06	6.62	8.52	8.16	8.24
Husband wants less	3.81	5.64	6.73	9.54	8.19	7.98
Don’t know	4.04	5.16	6.88	7.75	8.28	8.08
Region						
Kampala	2.50	3.59	4.87	5.37	8.10	7.02

Central 1	4.00	4.58	6.46	7.31	8.11	7.62
Central 2	4.44	5.31	7.46	8.40	8.10	7.65
East Central	4.60	5.20	6.94	5.93	8.16	7.95
Eastern	4.01	5.15	6.77	8.14	8.05	7.61
North	3.94	4.95	8.13	8.23	8.13	7.69
Karamoja	3.33	5.59	4.28	9.18	8.22	7.87
West-Nile	3.66	5.13	6.90	7.87	8.19	7.70
Western	4.40	4.85	7.21	7.07	8.25	8.39
Southwest	3.95	4.28	6.23	6.69	8.29	9.17
Place of Residence						
Urban	3.05	3.74	5.63	5.34	7.96	6.69
Rural	4.20	5.05	6.84	7.69	8.02	8.29
Community Level of Female Education						
Low	4.25	4.99	7.50	8.03	8.08	8.20
Medium	4.27	5.13	6.66	7.30	8.11	8.10
High	3.36	4.18	5.41	6.37	7.98	7.12
Community Level of Wealth						
Low	4.01	5.08	7.15	8.17	8.12	8.30
Medium	4.24	5.14	7.12	7.51	8.11	8.27
High	3.65	4.01	5.45	5.57	7.93	6.81
Community Level of Less Severe Physical GBV						
Low	3.84	4.91	5.91	7.21	7.98	7.41
Medium	4.04	4.58	6.62	7.00	8.07	8.04
High	4.14	5.11	7.65	7.86	8.12	8.14
Community Level of More Severe Physical GBV						
Low	3.90	5.49	6.13	8.63	7.97	7.28
Medium	4.06	5.02	7.11	6.88	8.12	8.34
High	4.12	4.81	7.66	7.85	8.06	8.13

5.6 Summary of the Chapter

This chapter provides an overview of the levels, patterns and differentials of fertility by the RH outcomes, socio-demographic factors and each severity of physical GBV (less and more severe physical GBV).

Indirect methods (P/F Ratio and Relational Gompertz) and direct measures (mean CEB, mean achieved fertility, and TFRs) were shown for every year of DHS since 1989 until 2011. Fertility levels in the country have remained decreased by almost one child throughout the period, although stall in the late 1990s and early 2000s. However, the Brass P/F ratio shows slight under- and over-reporting of births in all years within different age groups, while the corrected or implied TFRs from the Relational Gompertz show slightly higher TFRs than those reported in 2011.

All women that experienced any severity of physical GBV had a higher mean CEB than those that had not experienced it. Furthermore, those that experienced less severe physical and more severe physical GBV also had higher mean achieved fertility rates. On the other hand, only those that experienced less severe physical GBV showed higher TFRs than those that did not; for more severe physical GBV the TFR was lower amongst those that had experienced this severity of physical GBV.

When fertility differentials are compared for women who have experienced physical GBV and those that have not, by socio-demographic factors and RH outcomes, results show that except for a few exceptions mean children ever born is consistently higher amongst women who experience both severities of physical GBV. One key exception that is seen in both severities of physical GBV is that women who have a higher than secondary level of education, and who have experienced GBV, have a lower mean CEB than those that have never experienced GBV. Mean achieved fertility and TFR, on the other hand, show varying patterns dependent on severity of physical GBV. In some instances, GBV seems to circumvent the benefits of certain socio-demographic factors in depressing fertility levels, such as with place of residence, education and age at first cohabitation.

The three RH outcomes are defined as part of the conceptual model and current literature, namely current contraceptive use, planning status of previous pregnancy, and whether a woman ever had a pregnancy terminated (either by stillbirth, miscarriage or forced abortion). The fertility rates by RH outcomes shows that the mean CEB was lowest amongst those that were on no method of contraception, while the lowest mean achieved fertility and TFR were amongst those who used traditional methods. One probable explanation could be that women only begin to use contraceptives after they have begun child-bearing, and not before as a preventive strategy. Furthermore, the high rate of women who stated that they did not use any form of contraception coupled with the high levels of mean CEB, mean achieved fertility, and TFR for women who stated that their previous pregnancy was unplanned warrants further investigation regarding unmet need for contraceptives. The TFR for women who had not planned their previous pregnancy was 11.81 children per women, compared to 8.70 for those that stated that their previous pregnancy was planned. Furthermore, who had experienced a termination of pregnancy all had higher mean CEB, mean achieved fertility and TFR. Given that this variable, for Uganda, does not make the distinction between stillbirths, miscarriages and forced abortions it is difficult to pinpoint specific explanations for this. However, there are many possible reasons. First is that being mothers have experienced a stillbirth and / or miscarriage, it could be the fear of losing subsequent children that leads to them bearing more children “in case” one or more die. Alternatively, women could be using abortion to limit their fertility given that they already have more children than they want.

The difference in fertility rates by RH outcomes shows that those women who had not experienced GBV had more or less the same fertility rates as the general population. However, those that did experience GBV had higher rates of fertility – this was true of all three fertility measures, but consistently so with mean CEB. On the other hand, more severe physical GBV women who experienced a termination of pregnancy and experienced GBV had a lower mean achieved fertility than women who did not experience GBV; whilst those who had not experienced a termination of pregnancy but who had experienced any severity of physical GBV had lower TFRs than those who did not.

Mukiga women had a TFR of 12.25 children per women, followed by Munyankole women (10.25). The lowest TFR was amongst Muganda women (5.49), who also had the lowest mean CEB (2.89) and mean achieved fertility (6.16). Musoga women had the highest mean CEB (4.43), whilst Munyankole women had the highest mean achieved fertility (7.82).

Low levels of schooling and educational attainment could be one of the reasons for high fertility, but also one of the reasons for such high rates of GBV amongst Ugandan women. This could well be due to the low age at first cohabitation, which has been shown to lead to women not completing their education and often places women in a situation where they are not able to negotiate their RH and other desires. Furthermore, young age at first cohabitation also means that the woman is at risk of higher fertility levels, given that they are exposed to sexual relations earlier than someone who first cohabitates at older ages. Women with no education had a mean CEB of 5.81 and a TFR of 9.13, compared to 1.60 and 3.96 amongst women who had a higher than secondary level of schooling, respectively. Furthermore, age at first cohabitation shows this distinct pattern as well - the lower the age of first cohabitation the higher the fertility rate. However, the difference between fertility rates of those who cohabitate below age 15 years and those between age 15 and 19 is marginal. The greatest decrease in fertility is seen once women first cohabitate between ages 20 and 24 years. The mean achieved fertility rate and the TFR decreased even lower for those that first cohabitated at age 25 years or more, although the mean CEB showed a slight increase from the mean CEB of those who first cohabitated at ages 20 to 24 years. Unfortunately, some of the gains in decreased fertility from higher ages at first cohabitation and higher educational levels are circumvented by the incidence of GBV. Generally, all three fertility rates showed a marked increase for women who experienced GBV, compared to those that did not.

Within household factors included were household wealth status and asymmetry of desired number of children. Wealth status shows a strange pattern, fertility levels are highest amongst women in the middle wealth status, and lower in the poor and rich wealth status. Even when controlling for any of the forms of GBV, this pattern remains – although experiencing GBV increases the fertility rates of women, irrespective of household's wealth status.

The mean CEB was higher for those women whose partners wanted more children, while the mean achieved fertility was highest amongst those whose partners wanted less children than they did. Further, the highest reported TFR in 2011 was amongst those women who reported that they and their partners wanted the same number of children. It could be that many did not want any more children as their partners had reached their desired number of children. Furthermore, large family size and a larger number of children is a cultural norm for both Ugandan men and women. Children are seen as a source of wealth, and it does therefore not astonish that so many partners desired more children despite the already high level of fertility and that women involved in household decisions had higher fertility rates as well. In general, mean CEB was higher amongst those that experienced GBV irrespective whether their partners wanted more children or not – and this was the case for the mean achieved fertility and reported TFR amongst those women who reported to have experienced less severe GBV as well, while those that reported more severe physical GBV showed a less distinct pattern.

The highest mean CEB was amongst women in East central region (4.25) and the lowest was in Kampala (1.91), which is also an urban area. Whilst Kampala also had the lowest mean achieved fertility TF rates, Central 2, West Nile and the Western region had the highest achieved fertility (over 7 children per woman). The highest TFR, on the other hand, was amongst women living in the Western (10.03 children per woman) and Southwest (17.41 children per woman) regions. All the fertility rates were markedly lower for women living in urban areas, compared to those living in rural areas. Furthermore, fertility rates decreased as the percentage of women with secondary or higher educational status in the community increased. For instance, the mean CEB for women living in communities with low percentage of women with secondary or higher educational attainment was 4.01 compared to 2.72 for women living in communities where percentages were high.

Ugandan women of reproductive age, in general, had lower fertility rates if they lived in communities where the percentage of households classified as richer and richest was high; although there was not much variation between women living in communities where these percentages were low and medium. However, the difference between the fertility rates amongst those women who experienced less severe physical GBV but whom lived in communities where percentage of households classified as richer or richest were only marginally higher compared to women who did not experience less severe physical GBV.

On the other hand, the increase in fertility rates (mean CEB, mean achieved fertility and reported TFR) was much higher amongst those that lived in communities where these percentages were low and medium and who had experienced less severe GBV, compared to those that did not. Whereas the pattern was more varied amongst those who experienced more severe GBV.

In general, the higher the percentage of women in the community that experienced either less or more severe GBV, the higher the fertility rate – the only slight variation seen was amongst the reported TFR, whereby women who lived in communities where the percentage of women who experienced more severe GBV was medium had a higher TFR compared to those who lived in communities where these percentages were high. When comparing the fertility rates amongst women who had and had not experienced physical GBV, this pattern remains for most women – irrespective of whether they had or had not experienced less severe GBV. The exception is the mean achieved fertility amongst women who had experienced less severe GBV – in this instance the highest mean achieved fertility was amongst women who lived in communities with low percentages of women who experienced less severe GBV, followed by women who lived in communities where these percentages were high. Furthermore, in almost all instances the fertility rates were highest amongst those women who experienced less severe GBV, compared to those that did not. Again, the exception was in the mean achieved fertility – women who had not experienced less severe GBV, but who lived in communities where a high percentage of women did experience this severity of physical GBV, had a higher mean achieved fertility compared to women living in these communities but who themselves experienced less severe physical GBV. Similarly, the pattern remained almost the same when looking at community level of severe physical GBV. In most cases fertility rates increased as the percentage increase of women that had experienced more severe physical GBV increased, and there was an increase in the fertility rates of women who experienced less severe GBV but whom lived in these communities.

The TFR amongst women who experienced more severe physical GBV was lower than those who did not, but who lived in communities where the percentage of women who experienced less severe physical GBV was medium or low. Women living in communities where these percentages were high, and who experienced more severe GBV, had only a slightly higher TFR compared to women who did not experience more severe physical GBV but whom lived in these communities. For mean CEB and achieved fertility, the fertility rates were consistently higher amongst those who experienced more severe physical GBV – irrespective of whether they lived in communities where the percentage of women who experienced less severe physical GBV was low, medium or high. Similarly, amongst all three direct fertility measures, fertility rates were higher amongst women who experienced more severe physical GBV compared to women who did not, irrespective of whether they lived in communities where the percentage of women who experience more severe physical GBV was low, medium or high. The two small exceptions, however, was in the mean achieved fertility of women who lived in communities where percentages of women who experienced more severe physical GBV was medium, and the TFR amongst women who lived in communities where the percentage of women who experienced more severe physical GBV was low – in both these cases, women who had not experienced more severe physical GBV themselves had a higher fertility rate compared to those who had experienced it.

CHAPTER SIX

THE INDIVIDUAL AND SOCIAL CONTEXT OF FERTILITY WITH PHYSICAL GBV IN UGANDA

6.1 Introduction

The first section begins with the adjusted models for less and more severe GBV with the individual, household and contextual factors to assess the relationship between these factors and the two moderating factors (less and more severe physical GBV, respectively). This is then followed by the adjusted models which investigate the individual and social (household and contextual) context of fertility. The first adjusted model for fertility does not include any severity of physical GBV. The two models that follow subsequently assess the adjusted models which include less and more severe physical GBV to compare any changes in the results with the individual and social context, respectively.

The second section in the chapter presents the multi-level results, following the same order as the adjusted Poisson results. The first set of Multi-level Poisson results for fertility in Uganda do not include in severity of physical GBV (the A models), followed by Multi-level Poisson results for fertility that include less (the B models) and more severe physical GBV (the C models), respectively. This is done to assess any changes in the between and within community variations when no, less and more severe physical GBV is included in the models. For each of the sets of multi-level results, 4 models are included. Model 0 (reference model) is the same for each of the three sets of multi-level results and is the empty model. Model 1 includes only the reproductive health outcomes, model 2 includes the reproductive health outcomes with the individual factors only, and model 3 includes the reproductive health outcomes with the household factors only. Model 3 includes the reproductive health outcomes with the community-level factors, followed by the final model (model 4) which in the full model that includes all the factors together.

6.2 The Individual and Social Context of Fertility with GBV: Adjusted Results

Table 6.1 below shows the results of the adjusted model for less severe physical GBV. Intention of previous pregnancy, ethnicity (except amongst Ateso women), religion, educational status, age at first cohabitation, region, place of residence, community level of education, community level of more severe physical GBV, and community level of wealth were no longer significant in the adjusted model.

In the adjusted model, women who had planned their previous pregnancy were 29% less likely to experience less severe physical GBV than women who had not planned their previous pregnancy – compared to 24% in the unadjusted model. Furthermore, Ateso women were 2 times more likely to experience less severe physical GBV than Muganda women in the adjusted model.

Only those in households classified as richer and richest showed significant result, these women were 59% and 55% less likely to experience less severe physical GBV, compared to women living in households classified as poorest. Furthermore, women whose husbands wanted more children than they did had a 90% higher likelihood of experiencing less severe physical GBV than women whose husbands wanted to the same number of children. Women whose husbands wanted less, however, were 2 times more likely to experience less severe physical GBV.

In the adjusted model, women who lived in communities with medium and high percentages of women who experience less severe physical GBV were themselves 3.62 and 14.05 times more likely to experienced less severe physical GBV than women living in communities where percentages were low.

Table 6.1: Adjusted Odds Ratios for Less Severe Physical GBV with All Factors and Reproductive Health Outcomes [UDHS, 2011]

	Less Severe GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.57	0.22 - 1.52	0.27
Modern Method	1.05	0.72 - 1.53	0.81
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.76	0.55 - 1.03	0.08
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.71 *	1.21 - 2.43	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	2.14	0.96 - 4.78	0.06
Musoga	1.27	0.53 - 3.04	0.60
Mukiga	1.90	0.74 - 4.84	0.18
Ateso	2.85 *	1.13 - 7.17	0.03
Other	1.97	1.01 - 3.83	0.05
Religion			
Catholic	**RC**		
Protestant	0.70	0.47 - 1.02	0.06
Muslim	0.90	0.55 - 1.48	0.69
Pentecostal	0.63	0.39 - 1.04	0.07
SDA	0.58	0.16 - 2.06	0.40
Other	0.58	0.12 - 2.80	0.49
Highest Education Level			
No education	**RC**		
Primary	1.32	0.86 - 2.02	0.21
Secondary	0.87	0.47 - 1.62	0.66
Higher	0.58	0.18 - 1.87	0.36
Employment Status			
Not employed	**RC**		

Employed	0.82	0.58 - 1.15	0.26
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.90	0.60 - 1.35	0.60
20-24 Years	0.48	0.28 - 0.80	0.01
25 and Above	0.47	0.18 - 1.22	0.12
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.12	0.75 - 1.67	0.58
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.65	0.41 - 1.03	0.07
Middle	0.74	0.44 - 1.24	0.25
Richer	0.41 *	0.22 - 0.75	0.00
Richest	0.45 *	0.21 - 0.95	0.04
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.90 *	1.28 - 2.81	0.00
Husband wants less	2.02 *	1.09 - 3.73	0.03
Don't know	1.34	0.90 - 2.01	0.15
Community Factors			
Region			
Kampala	**RC**		
Central 1	0.71	0.28 - 1.80	0.47
Central 2	0.48	0.19 - 1.22	0.12
East Central	0.82	0.32 - 2.10	0.69
Eastern	0.66	0.26 - 1.66	0.37
North	0.96	0.37 - 2.48	0.93
Karamoja	0.81	0.29 - 2.26	0.69
West-Nile	0.70	0.27 - 1.81	0.46
Western	0.86	0.34 - 2.18	0.75
Southwest	0.89	0.32 - 2.45	0.82
Place of Residence			
Urban	**RC**		
Rural	1.10	0.60 - 2.04	0.75
Community Level of Female Education			
Low	**RC**		
Medium	0.96	0.66 - 1.39	0.81
High	1.56	0.91 - 2.68	0.11
Community Level of Wealth			
Low	**RC**		
Medium	1.45	0.95 - 2.23	0.09
High	1.71	0.83 - 3.51	0.14
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	3.62 *	2.34 - 5.60	0.00
High	14.05 *	8.73 - 22.62	0.00
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	1.39	0.93 - 2.07	0.11
High	1.24	0.81 - 1.91	0.32

Table 6.2 shows the results of the adjusted analysis for more severe physical GBV. Various changes were seen in the factors that remained significant, in comparison to the unadjusted model. However, educational status, region, place of residence, community

level of female education, community level of wealth and community level of less severe physical GBV were no longer significant factors in the adjusted model.

Amongst the RH outcomes in the adjusted model, women who had planned their previous pregnancy and women who had experienced a termination of pregnancy were 30% less likely and 60% more likely to experience more severe physical GBV compared to women who had not planned their previous pregnancy and not experienced a termination of pregnancy, respectively.

Munyankole women and women from smaller ethnic groups included in the category of other were 4.32 and 2.50 times more likely to experience more severe physical GBV than women from the Muganda tribe. Furthermore, in the adjusted model, women from the Pentecostal religion were 59% less likely to experience more severe physical GBV than women from the Catholic religion.

Only those women who had first cohabitated between ages 20-24 years showed significant results, these women were 50% less likely to experience more severe physical GBV than women who had first cohabitated below the age of 15 years.

Amongst the household factors, only the category of richer under household wealth and in the instance whereby a women’s husband wanted more children than they did showed significant results. Women in richer households 69% less likely than women in the poorest households to experience more severe physical GBV. On the other hand, women whose husbands wanted more children than they did were 99% more likely to experience more severe physical GBV than women whose husbands wanted the same number of children.

Finally, the only community factor to remain significant in the adjusted model was the computed community factor of community level of more severe physical GBV. Women who lived in communities with medium or high percentages of women who experience this severity of physical GBV were 7.31 and 22.80 times more likely to experience more severe physical GBV themselves, than women living in communities where these percentages were low, respectively.

Table 6.2: Adjusted Odds Ratios for More Severe Physical GBV with All Factors and Reproductive Health Outcomes [UDHS, 2011]

	More Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.45	0.13 - 1.63	0.23
Modern Method	1.21	0.75 - 1.94	0.43
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.60 *	0.41 - 0.88	0.01
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.65 *	1.09 - 2.48	0.01
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	4.32 *	1.53 - 12.19	0.01
Musoga	0.74	0.21 - 2.62	0.64
Mukiga	2.83	0.83 - 9.67	0.10
Ateso	2.65	0.82 - 8.54	0.10
Other	2.50 *	1.03 - 6.09	0.04
Religion			
Catholic	**RC**		
Protestant	0.95	0.60 - 1.50	0.83
Muslim	0.73	0.40 - 1.35	0.32
Pentecostal	0.41 *	0.21 - 0.77	0.01
SDA	0.71	0.12 - 4.15	0.71
Other	0.38	0.06 - 2.29	0.29
Highest Education Level			
No education	**RC**		
Primary	1.06	0.66 - 1.72	0.80
Secondary	0.51	0.23 - 1.12	0.09
Higher	0.20	0.02 - 1.78	0.15
Employment Status			
Not employed	**RC**		

Employed	0.85	0.57 - 1.28	0.45
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.70	0.45 - 1.11	0.13
20-24 Years	0.50 *	0.27 - 0.92	0.03
25 and Above	0.32	0.09 - 1.14	0.08
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	0.86	0.54 - 1.38	0.53
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.77	0.47 - 1.26	0.29
Middle	0.83	0.46 - 1.52	0.55
Richer	0.31 *	0.14 - 0 .67	0.00
Richest	0.39	0.14 - 1.05	0.06
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.99 *	1.23 - 3.22	0.01
Husband wants less	1.50	0.70 - 3.22	0.30
Don't know	1.49	0.91 - 2.46	0.12
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.02	0.26 - 4.07	0.98
Central 2	0.67	0.17 - 2.70	0.58
East Central	1.38	0.33 - 5.74	0.66
Eastern	0.64	0.15 - 2.63	0.54
North	1.15	0.29 - 4.64	0.84
Karamoja	1.26	0.29 - 5.43	0.76
West-Nile	0.90	0.22 - 3.66	0.88
Western	0.58	0.14 - 2.38	0.45
Southwest	0.68	0.15 - 3.02	0.61
Place of Residence			
Urban	**RC**		
Rural	1.29	0.58 - 2.87	0.54
Community Level of Female Education			
Low	**RC**		
Medium	0.96	0.62 - 1.47	0.84
High	1.66	0.80 - 3.44	0.17
Community Level of Wealth			
Low	**RC**		
Medium	1.74	1.04 - 2.91	0.04
High	1.92	0.76 - 4.89	0.17
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	0.81	0.46 - 1.45	0.49
High	1.18	0.66 - 2.11	0.57
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	7.31 *	3.94 - 13.58	0.00
High	22.80 *	11.83 - 43.95	0.00

Table 6.3 shows that women who stated that they were currently on traditional methods of contraception had 26% more children than women who were not currently on any method of contraception. Women who stated they were on modern methods, however,

was not significant. On the other hand, the other two reproductive health outcomes showed similar results to the unadjusted model – women who stated that their previous pregnancy was planned had 18% (compared to 19% in the unadjusted model) less children ever born than those who stated that it was not planned; and women who had experienced a termination of pregnancy had 17% (compared to 16% in the unadjusted model) more children than those women who had not.

Ethnicity and the women belonging to the SDA religious category were no longer significant in the adjusted model. On the other hand, all the remaining individual-level factors remained significant in the adjusted model. Women who had a primary, secondary and higher than secondary education had 27%, 45% and 53% less children ever born compared to women with no education. On the other hand, women who were employed had 9% more children than women who were not employed.

Unlike the unadjusted results, where all age categories of first cohabitation were significant, the category of women who had first cohabitated at age 25 years or older was no longer significant in the adjusted model. However, women who first cohabitated between the ages of 15 and 19 years had 14% less children ever born, and those that first cohabitated between the ages of 20 and 24 years had 12% less children ever born, compared to women who first cohabitated at age 15. However, women who were involved in key decisions of the household had 14% more children than women who were not involved in decisions made for the household.

In the adjusted model, only three categories of the household factors remained significant. Women who lived in households classified as richer had 15% more children than women living in the poorest households. Furthermore, women whose husbands wanted more children than they did had 20% more children ever born, and women who did not know whether their husband wanted less / the same / more children than they did have 19% more children ever born, compared to women who had husbands who wanted the same number of children.

Amongst the contextual factors, community level of wealth, less severe physical GBV and more severe physical GBV were no longer significant predictors. Furthermore, most of the regions of Uganda (in comparison to the Kampala region) were no longer significant either. Only the regions of Central 1 and 2 showed significant results in the adjusted model – women living in these regions had 24% and 27% more children than women that lived in the Kampala region. Place of residence, on the other hand, remained significant in the adjusted model. Women living in rural areas had 20% more children than women living in urban areas.

Finally, although the medium category was no longer significant in the adjusted model, women living in communities that had a high percentage of women who had secondary or higher educational level had 10% less children ever born than those women living in communities where these percentages were low.

Table 6.3: Adjusted Incidence Risk Ratios Children Ever Born with all Factors and Reproductive Health Outcomes – No Gender-Based Violence [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.26 *	1.07 - 1.48	0.01
Modern Method	1.05	0.98 - 1.13	0.19
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.82 *	0.77 - 0.87	0.00

Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.17 *	1.09 - 1.25	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	0.96	0.82 - 1.13	0.65
Musoga	1.06	0.90 - 1.26	0.47
Mukiga	1.03	0.86 - 1.23	0.79
Ateso	1.06	0.89 - 1.27	0.52
Other	1.04	0.92 - 1.17	0.55
Religion			
Catholic	**RC**		
Protestant	1.05	0.98 - 1.14	0.17
Muslim	1.03	0.94 - 1.14	0.53
Pentecostal	1.06	0.96 - 1.17	0.28
SDA	0.98	0.76 - 1.26	0.88
Other	0.98	0.79 - 1.31	0.91
Highest Education Level			
No education	**RC**		
Primary	0.73 *	0.67 - 0.79	0.00
Secondary	0.55 *	0.48 - 0.62	0.00
Higher	0.47 *	0.38 - 0.60	0.00
Employment Status			
Not employed	**RC**		
Employed	1.09 *	1.01 - 1.16	0.02
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.84 *	0.78 - 0.90	0.00
20-24 Years	0.88 *	0.79 - 0.97	0.01
25 and Above	0.84	0.70 - 1.01	0.06
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.14 *	1.05 - 1.23	0.00
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	1.02	0.93 - 1.12	0.69
Middle	1.06	0.95 - 1.17	0.28
Richer	1.15 *	1.02 - 1.29	0.02
Richest	1.10	0.95 - 1.28	0.21
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.20 *	1.11 - 1.30	0.00
Husband wants less	1.00	0.88 - 1.14	0.99
Don’t know	1.19 *	1.10 - 1.29	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.24 *	1.03 - 1.50	0.02
Central 2	1.27 *	1.06 - 1.53	0.01
East Central	1.21	0.99 - 1.47	0.06
Eastern	1.19	0.98 - 1.44	0.09
North	1.13	0.93 - 1.38	0.22
Karamoja	1.08	0.88 - 1.34	0.45
West-Nile	1.15	0.94 - 1.39	0.17
Western	1.18	0.98 - 1.43	0.08
Southwest	1.18	0.95 - 1.45	0.13
Place of Residence			
Urban	**RC**		
Rural	1.20 *	1.07 - 1.36	0.00
Community Level of Female Education			

Low	**RC**		
Medium	0.98	0.91 - 1.05	0.50
High	0.90 *	0.81 - 1.00	0.05
Community Level of Wealth			
Low	**RC**		
Medium	1.04	0.95 - 1.13	0.41
High	1.11	0.97 - 1.28	0.12
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	0.97	0.90 - 1.06	0.54
High	1.02	0.93 - 1.12	0.69
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	0.96	0.89 - 1.04	0.36
High	1.05	0.96 - 1.14	0.31

Table 6.4 below shows the adjusted results of the Poisson regression model where less severe physical GBV was included. Results were similar to the adjusted model that did not include either severity of GBV, with only minor changes. All the factors and categories that were no longer significant in the adjusted with no severity of GBV included, compared to the unadjusted model, remained non-significant when less severe physical GBV was included.

Those that experienced less severe physical GBV had 9% more children ever born compared to those that did not experience this severity of physical GBV. Furthermore, table 6.3 shows that women who stated that they were currently on traditional methods of contraception had 27% (1% higher than in the model with no GBV) more children than women who were not currently on any method of contraception. Women who stated that their previous pregnancy was planned had 18% (the same as the adjusted model without GBV) less children ever born than those who stated that it was not planned; and women who had experienced a termination of pregnancy had 16% (the same as the unadjusted model) more children than those women who had not.

For educational status, women who had a primary and secondary education showed the exact same results as the adjusted model with no GBV – 27% and 45% more children ever born compared to women with no education, respectively. However, whereas the previous model showed that women with a higher than secondary education had 53% less children ever born to them than women with no education, once less severe physical GBV was included in the model – the percentage change was 52% less children (one percentage point change). As with the previous adjusted model (with no severity of GBV included), women who were employed had 9% more children than women who were not employed.

Women who first cohabitated between the ages of 15 and 19 years had 16% less children ever born, and those that first cohabitated between the ages of 20 and 24 years had 11% less children ever born, compared to women who first cohabitated at age 15. However, women who were involved in key decisions of the household had 13% more children than women who were not involved in decisions made for the household.

Women who lived in households classified as richer had 16% more children than women living in the poorest households. Furthermore, women whose husbands wanted more children than they did, and for the category where this was not known, had 19% more children ever born, each.

While the adjusted results for the model that did not include any severity of GBV showed that women in Central 1 and 2 had 24% and 27% more children than women that lived in the Kampala region, in this model (where less severe GBV was included) these percentages changes to 25% and 29%, respectively. The percentage increase of children ever born (20%) remained exactly as it was in the first adjusted model for those living in rural areas, as did the percentage decrease (10%) of children ever born among women living in communities that had a high percentage of women who had secondary or higher educational level.

Table 6.4: Adjusted Incidence Risk Ratios Children Ever Born with all Factors and Reproductive Health Outcomes – Less Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Less Severe Physical GBV			
No	**RC**		
Yes	1.09 *	1.02 - 1.17	0.01
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.27 *	1.07 - 1.49	0.01
Modern Method	1.05	0.97 - 1.13	0.22
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.82 *	0.77 - 0.87	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.16 *	1.08 - 1.24	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	0.95	0.81 - 1.12	0.54
Musoga	1.06	0.90 - 1.26	0.48
Mukiga	1.02	0.85 - 1.22	0.85
Ateso	1.04	0.87 - 1.25	0.64
Other	1.03	0.91 - 1.16	0.68
Religion			
Catholic	**RC**		
Protestant	1.06	0.98 - 1.15	0.13
Muslim	1.04	0.94 - 1.14	0.48
Pentecostal	1.06	0.96 - 1.17	0.22
SDA	0.99	0.77 - 1.27	0.93
Other	0.99	0.75 - 1.32	0.96
Highest Education Level			
No education	**RC**		
Primary	0.73 *	0.67 - 0.79	0.00
Secondary	0.55 *	0.48 - 0.62	0.00
Higher	0.48 *	0.38 - 0.60	0.00
Employment Status			
Not employed	**RC**		
Employed	1.09 *	1.02 - 1.17	0.02
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.84 *	0.78 - 0.91	0.00
20-24 Years	0.89 *	0.80 - 0.98	0.02
25 and Above	0.85	0.71 - 1.02	0.08
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.13 *	1.04 - 1.23	0.00
Households Factors			
Wealth Status			
Poorest	**RC**		

Poorer	1.02	0.94 - 1.12	0.60
Middle	1.06	0.96 - 1.18	0.26
Richer	1.16 *	1.04 - 1.30	0.01
Richest	1.11	0.96 - 1.29	0.16
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.19 *	1.10 - 1.29	0.00
Husband wants less	0.99	0.87 - 1.13	0.91
Don't know	1.19 *	1.09 - 1.29	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.25 *	1.04 - 1.51	0.02
Central 2	1.29 *	1.07 - 1.55	0.01
East Central	1.21	0.99 - 1.47	0.06
Eastern	1.19	0.98 - 1.45	0.08
North	1.13	0.93 - 1.38	0.21
Karamoja	1.09	0.88 - 1.34	0.43
West-Nile	1.15	0.95 - 1.39	0.16
Western	1.19	0.9 - 1.44	0.07
Southwest	1.18	0.96 - 1.46	0.12
Place of Residence			
Urban	**RC**		
Rural	1.20 *	1.06 - 1.35	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.98	0.91 - 1.05	0.52
High	0.90*	0.80 - 1.00	0.04
Community Level of Wealth			
Low	**RC**		
Medium	1.03	0.94 - 1.12	0.52
High	1.10	0.96 - 1.27	0.16
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	0.96	0.88 - 1.04	0.30
High	0.98	0.89 - 1.08	0.63
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	0.96	0.88 - 1.04	0.28
High	1.04	0.95 - 1.14	0.35

The third adjusted model included more severe physical GBV. As with less severe GBV, women who experienced more severe GBV had 9% more children than women who did not experienced this severity of physical GBV (Table 6.5).

Only minor changes in the adjusted model that included more severe physical GBV were seen, all other results remained the same as the adjusted model that included less severe physical GBV. Women who had a higher than secondary level of education, in the adjusted model that included more severe physical GBV, had 52% less children ever born compared to women with no education. This was 1% lower than in the adjusted model that included no GBV was included, as well as the model where less severe GBV was included.

Table 6.5: Adjusted Incidence Risk Ratios Children Ever Born with all Factors and Reproductive Health Outcomes – More Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
More Severe Physical GBV			
No	**RC**		
Yes	1.09 *	1.02 - 1.17	0.01
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.27 *	1.07 - 1.49	0.01
Modern Method	1.05	0.97 - 1.13	0.22
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.82 *	0.77 - 0.87	0.00
Ever Had a Pregnancy Terminated			
No			
Yes	1.16 *	1.08 - 1.24	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	0.95	0.81 - 1.12	0.54
Musoga	1.06	0.90 - 1.26	0.48
Mukiga	1.02	0.85 - 1.22	0.85
Ateso	1.04	0.87 - 1.25	0.64
Other	1.03	0.91 - 1.16	0.68
Religion			
Catholic	**RC**		
Protestant	1.06	0.98 - 1.15	0.13
Muslim	1.04	0.94 - 1.14	0.48
Pentecostal	1.06	0.96 - 1.17	0.22
SDA	0.99	0.77 - 1.27	0.93
Other	0.99	0.75 - 1.32	0.96
Highest Education Level			
No education	**RC**		
Primary	0.73 *	0.67 - 0.79	0.00
Secondary	0.55 *	0.48 - 0.62	0.00
Higher	0.48 *	0.38 - 0.60	0.00
Employment Status			
Not employed	**RC**		
Employed	1.09 *	1.02 - 1.17	0.02
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.84 *	0.78 - 0.91	0.00
20-24 Years	0.89 *	0.80 - 0.98	0.02
25 and Above	0.85	0.71 - 1.02	0.08
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.13 *	1.04 - 1.23	0.00
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	1.02	0.94 - 1.12	0.60
Middle	1.06	0.96 - 1.18	0.26
Richer	1.16 *	1.04 - 1.30	0.01

Richest	1.11	0.96 - 1.29	0.16
Asymmetry for Desired Number of Children			
Both wants the same			
Husband wants more	1.19 *	1.10 - 1.29	0.00
Husband wants less	0.99	0.87 - 1.13	0.91
Don't know	1.19 *	1.09 - 1.29	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.25 *	1.04 - 1.51	0.02
Central 2	1.29 *	1.07 - 1.55	0.01
East Central	1.21	0.99 - 1.47	0.06
Eastern	1.19	0.98 - 1.45	0.08
North	1.13	0.93 - 1.38	0.21
Karamoja	1.09	0.88 - 1.34	0.43
West-Nile	1.15	0.95 - 1.39	0.16
Western	1.19	0.99 - 1.44	0.07
Southwest	1.18	0.96 - 1.46	0.12
Place of Residence			
Urban	**RC**		
Rural	1.20 *	1.06 - 1.35	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.98	0.91 - 1.05	0.52
High	0.90 *	0.80 - 1.00	0.04
Community Level of Wealth			
Low	**RC**		
Medium	1.03	0.94 - 1.12	0.52
High	1.10	0.96 - 1.27	0.16
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	0.96	0.88 - 1.04	0.30
High	0.98	0.89 - 1.08	0.63
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	0.96	0.88 - 1.04	0.28
High	1.04	0.95 - 1.14	0.35

6.3 The Individual and Social Context of Fertility with Physical GBV: Multi-Level Results

The remainder of this section shows the results of the models for the three-level multilevel analysis, looking at the effects of the individual, household and community level factors on children ever born. Multilevel modelling allows one to analyse the extent to which variations are attributed to the household and contextual factors, which linear regression models do not.

Table 6.6 below shows the results of model 0 to IVA (the A models do not include any severity of GBV) for the Multilevel Poisson for children ever born. Model 0, which contains none of the independent or explanatory variables, showed significant between community variation in children ever born, with a variance of 0.45; but only 0.8 for the within community variation (household level), but a between community VPC (or Intra-Correlation Coefficient) of 12.03% and within-community VPC of 2.37%.

Model 1, which includes only the individual level factors, shows that all RH outcomes, and categories in the highest educational level attained, employment status, age at first cohabitation and women's involvement in key-household decisions where significantly associated with children ever born. Women currently on traditional forms of contraception had 22% more children than women who were not currently on any form of contraception, whereas women on modern forms only had 8% more children. Furthermore, women who had planned their previous pregnancy had 21% less children compared to women who had not. On the other hand, women who had experienced a termination of pregnancy had 17% more children ever born, compared to those that had not.

Women who had completed primary school education had 26% less children than those with no education, whilst those with a secondary and higher level of education had 48% and 54% less children than those with no education, respectively. Women who were employed, on the other hand, had 9% more children ever born than those that were not employed. Women who had cohabitated between the ages of 15-19 years and 20-24 years had 16% and 14% less children than women who had first cohabitated when they were less than 15 years old, respectively; women who first cohabitated above the age of 25 years had 18% less children. Furthermore, women that had some involvement in household decision-making had 11% more children than those who were not involved at all in household decisions.

Model 1A shows that the variation in children ever born was significant across communities showing a variance of 0.04 and within communities by 0.01, and a VPC of 1.20% and 0.30% respectively. Furthermore, the estimated PCV in Model 1, compared to Model 0, shows that 91.11% and 87.50% of the variance associated with children ever born was between- and within-community variations, respectively.

In Model 2A (includes the RH outcomes with household factors only) shows that, unlike in Model IA where both categories of current contraceptive methods were significant – women who were currently on modern methods was no longer significant in this model. Women currently on traditional forms of contraception had 22% more children than women who were not currently on any form of contraception. Woman who had planned their previous pregnancy had 19% less children than woman who had not planned their previous pregnancy, 2% lower than the percentage in Model IA were only individual factors were included with the RH outcomes. Furthermore, while in Model 1A women who had experienced a termination of pregnancy had 17% more children than those who had not, this percentage changed to 18% more children in model 2A.

Only three categories amongst the household factors were statistically significant with children ever born in Model 2A. Those women living in households classified as richest had 29% less children than women living in the poorest households. Furthermore, women whose husbands wanted more children and those that did not know their husbands' preference had 23% and 22% more children ever born compared to women whose husbands wanted the same number of children as them, respectively. Model 2A shows that the variation in children ever born was significant across communities showing a variance of 0.07 and within communities by 0.02, and a VPC of 2.08% and 0.60% respectively.

Model 3A shows that women currently on modern methods were again significant, when only the community level factors were included in the model with RH outcomes. Women on modern methods had 9% more children than women currently on no methods of contraception. Women who were currently on traditional methods of contraception, however, had 23% more children ever born. As in model 2A, women who had planned their previous pregnancy had 19% less children compared to those that had not. However, when community factors were included in the model instead of household factors, women who had ever experienced the termination of a pregnancy had 24% more children ever born (compared to 18% more children ever born in model 2A) than women who had never experienced a termination of pregnancy.

Only 4 out of the 9 regions were significant in this multi-level model. Women living in Central 2 and East central had 27% and 28% more children than women living in the Kampala region. Women living in the Karamoja region had 34% more children ever born, and women living in the Western region had 24% more children ever born, compared to women who were living in the Kampala region. Furthermore, women living in rural areas had 27% more children ever born than women who lived in urban areas – such as Kampala. The only other category that was significant amongst the computed community level factors in this model was the category of high in the community level of female education. Women living in communities that had a high percentage of women with secondary or higher education had 24% less children than women who lived in areas were these percentages were low. Model 3A showed a higher variation in children ever born than model 2A, showing a variance of 0.09 across communities, but a lower within communities' variance of less than 0.01. In this model the VPC was 2.66% for the between community variation, but no within community variation was seen (0%).

In the final multi-level model in which no severity of GBV was included (Model 4A) none of the computed community level factors was significant, even the category of high in the community level of female education. Furthermore, where 4 regions showed significant results in the previous model, only Central 1 and 2 were significant in Model 4 A. Women from these regions had 24% and 27% more children ever born than women living in the Kampala region, respectively. Also, in Model 4A women living in rural areas had 21% more children ever born than women living in urban areas – a decrease of 6% from the percentage seen in Model 3A.

Like the results seen in Model 2A (RH outcomes with household factors only) showed that women whose husbands wanted more children than they did, and women who did not know their husbands' preference, had 20% and 19%, respectively, more children ever born compared to women whose husbands wanted the same number of children as they did, respectively. Unlike model 3A where the category that was significant under household wealth status was amongst the richest, in this model women living in households classified as richer had 15% more children ever born compared to women living in the poorest households.

Even though women who first cohabitated at age 25 years and older was no longer significant, as it had been in Model 2A (RH outcomes with individual factors only). The remaining individual-level factors, however, showed very similar results to Model 2A. Women who first cohabitated at ages 15-19 years and 20-24 years had 17% and 13% less children ever born compared to those who had first cohabitated below the age of 15, respectively. Furthermore, women who were involved in household decision-making had 14% more children ever born than women who were not involved in these decisions in the household.

Women who were employed, as in Model 2A, had 9% more children ever born than women who were not employed. Furthermore, women with a primary, secondary and higher than secondary level of schooling had 27%, 45% and 52% less children ever born compared to women with no education, respectively.

In this model, like in Model 2A, women currently on modern methods of contraception was no longer significant. However, women on traditional forms of contraception had 26% more children ever born compared to women that were not currently on any method of contraception. As in Model 1A, which only included the RH outcomes and the individual level factors, women who had experienced a termination of pregnancy had 17% more children ever born than women who had not. Finally, women who had planned their previous pregnancy had 18% less children ever born than women who had not.

The variances for Models were all significant. Model 1A only included the reproductive health outcomes and individual level factors showed a variance of 0.04 and a

VPC of 1.20% at the community level but a variance of 0.01 and a VPC of 0.30% at the household level. When compared to the empty or reference model, this shows that community and household level factors no longer explained much variation in children ever born suggesting that reproductive health outcomes and the individual level factors are important explanatory factors. Given that the PCVs are 91.11% (between community variation) and 87.50% (within community variation), reproductive health outcomes and the selected individual level factors are important in explaining both the between- and within-community variations in children ever born. However, models A2 and A3 showed decreases in both the between- and within-community variations once household and community factors were included in the models with reproductive health outcomes, respectively. Model 4A (full model), however, showed the lowest VPC for between community variation but the second lowest VPC for the within community variation (followed by model 3A which only included the community-level factors with the reproductive health outcomes). The full model shows that the inclusion of all the factors together explained 93% of the between community variation and 88% of the within community variation, although in comparing the results to the previous models – the reproductive and individual level factors explained a large portion of these variances.

Table 6.6: Effects of Individual, Household and Community Level Factors on Fertility in Uganda: Multilevel Poisson Incidence Risk Ratios – Models with no GBV [UDHS, 2011]

Characteristics	Model 0 Empty Model IRR	Model IA Individual IRR	Model IIA Household IRR	Model IIIA Community IRR	Model IVA Full IRR
Reproductive Health Outcomes					
Current Contraceptive Use					
No Method	**RC**	**RC**	**RC**	**RC**	**RC**
Traditional Method		1.22 *	1.21 *	1.23 *	1.26 *
Modern Method		1.08 *	1.03	1.09 *	1.05
Intention of Previous Pregnancy					
Birth Not Planned	**RC**	**RC**	**RC**	**RC**	**RC**
Birth Planned		0.79 *	0.81 *	0.81 *	0.82 *
Ever Had a Pregnancy Terminated					

No	**RC**	**RC**	**RC**	**RC**	**RC**
Yes		1.17 *	1.18 *	1.24 *	1.17 *
Individual Factors					
Ethnicity					
Muganda	**RC**	**RC**	**RC**	**RC**	**RC**
Munyankole		0.95			0.96
Musoga		1.03			1.07
Mukiga		0.97			1.02
Ateso		1.01			1.06
Other		0.98			1.04
Religion					
Catholic	**RC**	**RC**	**RC**	**RC**	**RC**
Protestant		1.07			1.05
Muslim		1.04			1.03
Pentecostal		1.06			1.05
SDA		1.04			0.98
Other		1.06			0.99
Highest Education Level					
No education	**RC**	**RC**	**RC**	**RC**	**RC**
Primary		0.74 *			0.73 *
Secondary		0.52 *			0.55 *
Higher		0.46 *			0.48 *
Employment Status					
Not employed	**RC**	**RC**	**RC**	**RC**	**RC**
Employed		1.09 *			1.09 *
Age at First Cohabitation					
Under 15 Years	**RC**	**RC**	**RC**	**RC**	**RC**
15-19 Years		0.84 *			0.83 *
20-24 Years		0.86 *			0.87 *
25 and Above		0.82 *			0.84
Household Decision-Making					
Women Not Involved in Decision-Making	**RC**	**RC**	**RC**	**RC**	**RC**
Women Involved in Decision-Making		1.11 *			1.14 *
Households Factors					
Wealth Status					
Poorest	**RC**	**RC**	**RC**	**RC**	**RC**
Poorer			0.95		1.02
Middle			0.93		1.06
Richer			0.98		1.15 *
Richest			0.71 *		1.11
Asymmetry for Desired Number of Children					
Both wants the same	**RC**	**RC**	**RC**	**RC**	**RC**
Husband wants more			1.23 *		1.20 *
Husband wants less			1.04		1.00
Don't know			1.22 *		1.19 *
Community Factors					
Region					
Kampala	**RC**	**RC**	**RC**	**RC**	**RC**
Central 1				1.18	1.24 *
Central 2				1.27 *	1.27 *
East Central				1.28 *	1.20
Eastern				1.18	1.18
North				1.13	1.13
Karamoja				1.34 *	1.08
West-Nile				1.17	1.14
Western				1.24 *	1.18
Southwest				1.13	1.18
Place of Residence					
Urban	**RC**	**RC**	**RC**	**RC**	**RC**
Rural				1.27 *	1.21 *

Community Level of Female Education					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				0.93	0.97
High				0.76 *	0.90
Community Level of Wealth					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				1.04	1.04
High				1.10	1.11
Community Level of Less Severe Physical GBV					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				1.00	0.97
High				1.02	1.02
Community Level of More Severe Physical GBV					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				0.95	0.96
High				1.04	1.05
Random Effects Parameters	**Model 0 Empty Model**	**Model IA Individual**	**Model IIA Household**	**Model IIIA Community**	**Model IVA Full**
Community Level					
Variance (SE)	0.45 (0.03) *	0.04 (0.01) *	0.07 (0.02) *	0.09 (0.01) *	0.03 (0.01) *
VPC = ICC (%)	12.03	1.20	2.08	2.66	0.90
Explained Variation (PCV) (%)	Reference	91.11	84.44	80.00	93.33
Household Level					
Variance (SE)	0.08 (0.02) *	0.01 (0.01) *	0.02 (0.01) *	0.00 (0.01) *	0.01 (0.01) *
VPC = ICC (%)	2.37	0.30	0.60	0.00	0.30
Explained Variation (PCV) (%)	Reference	87.50	75.00	100.00	87.50
Log-Likelihood	-4908.15	-2477.21	-2476.73	-2902.55	-2382.11
AIC	9822.30	5004.42	4981.46	5855.10	4864.21
BIC	9839.19	5130.346	5051.75	5984.54	5115.22

The second group of multi-level models for children ever born, or the B models, replicate the format of the A models but include less severe physical GBV. Some of the results remained the same, but there were many noticeable changes in the B models once less severe physical GBV was included, compared to where no GBV was included (models A).

Less severe physical GBV was significant in all models (models 1B to 4B). In models 1B (Less severe physical GBV, RH outcomes and individual level factors only) and 4B (Full model), women who experienced less severe physical GBV had 9% more children ever born than those women who had not. In model 2B (Less severe physical GBV, RH outcomes and household level factors only) and 3B (Less severe physical GBV, RH outcomes and community level factors only) women who experienced this severity of physical GBV had 10% and 11% more children ever born compared to women who had not experienced less severe physical GBV, respectively.

Changes seen in the B models on the RH outcomes, individual, household and community level factors included a percentage point increase amongst women on currently on traditional methods of contraception in Model 1B in comparison to Model 1A – in this model these women had 23% more children ever born than women who were currently on no method of contraception. Also, in this Model (Model 1B) women that had experienced a termination of pregnancy now had 16% more children ever born than women who had not, 1% less than Model 1A. Furthermore, women who had a secondary educational level now had 47% less children than women with no education, once less severe physical GBV was included in the model; whilst the remaining educational levels remained exactly as they were in Model 1A. Finally, one very noticeable change is that once less severe physical GBV was included in the model, the age at first cohabitation of 25 years or older was no longer significant; and the other two categories showed a percentage point difference each. Women that first cohabitated between the ages of 15-19 and 20-24 years now had 15% and 13% less children ever born than women who first cohabitated below the age of 15, respectively.

In model 2B, women who had experienced a termination of pregnancy had 17% more children ever born compared to women who had not, a 1% decrease from the model in which now less severe physical GBV was included. The other noticeable change in this model included a percentage point decrease in the IRR for the category in asymmetry of desired number of children in which the husband wanted more children than the women. For this category, women had 22% more children ever born compared to women whose husband wanted the same number of children as they did.

Model 3B was considerably different to model 3A, in which no less severe physical GBV was included. Specifically, women that planned their previous pregnancy had 20% less children than women who had not planned it. Furthermore, women who had experienced a termination of pregnancy had 19% more children ever born than women who had never experienced a termination of pregnancy. The corresponding IRRs in model 3A were 19% and 24%, respectively. Therefore, while including less severe physical GBV decreased the IRR for termination of pregnancy by 5%, it increased the IRR for planning status of previous pregnancy by 1%.

Changes in the model were seen in the community level factors as well. First, while women living in the Central 1 region did not have a significant IRR in model 3A, in model 3B women living in this region had 21% more children ever born than women living in the Kampala region. Furthermore, women living in the Central 2, East Central, and Karamoja had 25%, 26% and 33% more children ever born than women living in the Kampala region. While including less severe physical GBV in the model increased the IRRs for Central 2 and East Central, it decreased the IRR of Karamoja by 1%. Furthermore, including less severe physical GBV in the model decreased the IRR amongst women living in rural areas by 1%, in model 3B women living in rural areas had 26% more children ever born than women living in urban areas. The same was seen in model 4B in that women living rural areas had 20% more children ever born than women living in urban areas once all factors, including less severe physical GBV compared to model 4A were no less severe physical GBV was included and in which women living rural areas had 21% more children ever born than women in urban areas. Also, in model 4B, women living in Central 1 and 2 regions had 25% and 28% more children ever born, compared to women living in the Kampala region.

Furthermore, women whose husbands wanted more children than they did had 19% more children ever born compared to women whose husbands wanted the same number of children as they did. Women who were involved in key household decisions, had 13% more children than women who were not involved in these decisions at all. Both these categories showed percentage decrease in the IRR, in comparison to the full model in which no less severe physical GBV was included. This was also the case in the age at first cohabitation of 20-24 years as well as amongst women who had experienced a termination of pregnancy. In model 4B women who first cohabitated at this age had 12% less children ever born than women who first cohabitated below the age of 15. Finally, women who had experienced a termination of pregnancy had 16% more children ever born compared to those that had not.

Table 6.7 shows the multi-level results for the B models – those which include less severe physical GBV in the models. Results on the variances both between- and within-communities show similar results to the models that did not include any severity of GBV (the A models). However, although the PCV and VPC values remained the same in models 1A and 2A, in comparison to models 1B and 2B – there were noteworthy changes in models 3B and 4B, when compared to the models that did not include physical GBV. The measures of variation remained significant in all the models, but the between-community variations showed an increased PCV of 80% to 82% from model 3A to model 3B, and an increase from 93% to 96% from models 4A to model 4B. Furthermore, the within-community PCVs also showed changes once less severe physical GBV was included in the models. While the within-community PCVs were 100% in model 3A it decreased to 88% in model 3B, whilst remaining the same in models 4A and 4B. The between-community VPCs associated with children ever born decreased for both the 3 and 4 models, from 2.66% to 2.37% in model 3A to model 3B and from 0.90% to 0.60% in model 4A to model 4B. While the within-community VPC in model 3B increased from 0.00% in model 3A to 0.30%, the within-community VPC in model 4B remained as it was in model 4A.

Table 6.7: Effects of Individual, Household and Community Level Factors on Fertility in Uganda: Multilevel Poisson Incidence Risk Ratios – Models with Less Severe Physical GBV [UDHS, 2011]

Characteristics	Model 0 Empty Model IRR	Model IB Individual IRR	Model IIB Household IRR	Model IIIB Community IRR	Model IVB Full IRR
Less Severe Physical GBV					
No	**RC**	**RC**	**RC**	**RC**	**RC**
Yes		1.09*	1.10 *	1.11 *	1.09 *
Reproductive Health Outcomes					
Current Contraceptive Use					
No Method	**RC**	**RC**	**RC**	**RC**	**RC**
Traditional Method		1.23 *	1.21 *	1.23 *	1.26 *
Modern Method		1.08 *	1.03	1.09 *	1.05
Intention of Previous Pregnancy					
Birth Not Planned	**RC**	**RC**	**RC**	**RC**	**RC**
Birth Planned		0.79 *	0.81 *	0.80 *	0.82 *
Ever Had a Pregnancy Terminated					
No	**RC**	**RC**	**RC**	**RC**	**RC**
Yes		1.16 *	1.17 *	1.19 *	1.16 *
Individual Factors					
Ethnicity					
Muganda	**RC**	**RC**	**RC**	**RC**	**RC**
Munyankole		0.94			0.94
Musoga		1.02			1.07
Mukiga		0.96			1.01
Ateso		0.98			1.04
Other		0.97			1.03
Religion					
Catholic	**RC**	**RC**	**RC**	**RC**	**RC**
Protestant		1.08			1.06
Muslim		1.04			1.03
Pentecostal		1.07			1.06

SDA		1.05			0.99
Other		1.07			1.00
Highest Education Level					
No education	**RC**	**RC**	**RC**	**RC**	**RC**
Primary		0.74 *			0.73 *
Secondary		0.53 *			0.55 *
Higher		0.46 *			0.48 *
Employment Status					
Not employed	**RC**	**RC**	**RC**	**RC**	**RC**
Employed		1.09 *			1.09 *
Age at First Cohabitation					
Under 15 Years	**RC**	**RC**	**RC**	**RC**	**RC**
15-19 Years		0.85 *			0.83 *
20-24 Years		0.87 *			0.88 *
25 and Above		0.83			0.85
Household Decision-Making					
Women Not Involved in Decision-Making	**RC**	**RC**	**RC**	**RC**	**RC**
Women Involved in Decision-Making		1.11 *			1.13 *
Households Factors					
Wealth Status					
Poorest	**RC**	**RC**	**RC**	**RC**	**RC**
Poorer			0.96		1.03
Middle			0.94		1.07
Richer			1.00		1.17 *
Richest			0.73 *		1.12
Asymmetry for Desired Number of Children					
Both wants the same	**RC**	**RC**	**RC**	**RC**	**RC**
Husband wants more			1.22 *		1.19 *
Husband wants less			1.03		0.99
Don’t know			1.22 *		1.19 *
Community Factors					
Region					
Kampala	**RC**	**RC**	**RC**	**RC**	**RC**
Central 1				1.21 *	1.25 *
Central 2				1.25 *	1.28 *
East Central				1.26 *	1.21
Eastern				1.15	1.19
North				1.09	1.13
Karamoja				1.33 *	1.09
West-Nile				1.14	1.14
Western				1.24 *	1.19
Southwest				1.11	1.19
Place of Residence					
Urban	**RC**	**RC**	**RC**	**RC**	**RC**
Rural				1.26 *	1.20 *
Community Level of Female Education					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				0.95	0.97
High				0.76 *	0.90
Community Level of Wealth					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				1.04	1.03
High				1.10	1.10
Community Level of Less Severe Physical GBV					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				0.98	0.96
High				0.97	0.98

Community Level of More Severe Physical GBV					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				0.95	0.95
High				1.03	1.04
Random Effects Parameters	**Model 0 Empty Model**	**Model IB Individual**	**Model IIB Household**	**Model IIIB Community**	**Model IVB Full**
Community Level					
Variance (SE)	0.45 (0.03) *	0.04 (0.01) *	0.07 (0.02) *	0.08 (0.01) *	0.02 (0.01) *
VPC = ICC (%)	12.03	1.20	2.08	2.37	0.60
Explained Variation (PCV) (%)	Reference	91.11	84.44	82.22	95.56
Household Level					
Variance (SE)	0.08 (0.02) *	0.01 (0.01) *	0.02 (0.01) *	0.01 (0.01) *	0.01 (0.01) *
VPC = ICC (%)	2.37	0.30	0.60	0.30	0.30
Explained Variation (PCV) (%)	Reference	87.50	75.00	87.50	87.50
Log-Likelihood	-4908.15	-2472.11	-2471.02	-2801.70	-2377.20
AIC	9822.30	4996.23	4972.04	5655.40	4856.39
BIC	9839.19	5127.17	5047.34	5789.14	5112.37

The final group of multi-level models for children ever born, Models C, included more severe physical GBV as opposed to no GBV (Models A) and less severe physical GBV (Models B).

More severe physical GBV significantly increased children ever born amongst women who experienced this severity of GBV, compared to those that did not, in all of the models' C (Models 1C to 4C). In models 1C (More severe physical GBV, RH outcomes and individual level factors only) and 4C (Full model) women who experienced this severity of physical GBV had 11% more children ever born, compared to women that did not; while in models 2C (More severe physical GBV, RH outcomes and household level factors only) and 3C (More severe physical GBV, RH outcomes and community level factors only) these women had 13% and 15% more children ever born.

There were some noticeable changes in this set of models, in comparison to both models' A (no GBV included) and models' B (less severe physical GBV). Amongst current contraceptive use, in Model 1C, women who were currently on traditional methods of contraception also had 23% more children ever born compared to women who were not currently on any contraception – whilst this was the same IRR as in model 1B, it was 1% higher than 1A (no GBV). Furthermore, in model 3C and 4C, the IRR for this category was different to both the corresponding model A and B. In model 3C, women currently on traditional methods of contraception had 22% more children ever born than women on no contraception, whilst in the full model (model 4C) this is increased to 27% more children ever born.

For all C models, the IRR for intention of previous pregnancy remained the same as those in models B (less severe physical GBV), but in model 3C the IRR was 1% point different to model 1C – in model 1C (no GBV) women who had planned their previous pregnancy had 19% less children ever born than women who did not plan their previous pregnancy, while in model 3C this changed to 20% less children ever born.

For the RH outcome, ever had a pregnancy terminated, in Model 1C women who had experienced a termination of pregnancy had the same IRR as in model 1A (no GBV) but a 1% higher IRR than in model 1B (less severe physical GBV). These women had 17% more children ever born than women who had not experienced a termination in pregnancy. On the other hand, for the remaining models, the IRR remained the same as what it was when less severe physical GBV was included, but different to the models' A (no GBV).

For educational status, only in model 1C were their noticeable differences. In model 4C the IRRs for each category remained as they were in both model 4A and 4B. In Model 1C, women with a secondary educational status had the same IRR as in model 3C, but 1% point different to the IRR in model 1C. Once more severe physical GBV was included in the model, women with a secondary level of education had 47% less children ever born than women with no education. On the other hand, amongst women with a higher than secondary education had 53% less children ever born than women with no education, compared to 52% in model 1C and 2C.

Age at first cohabitation, in the models in which more severe physical GBV was included, showed similar results as models in which less severe physical GBV (models B), and therefore the same differences with models A. The one difference was in model 4C in which women who first cohabitated between the ages of 15-19 years had 16% less children ever born compared to those that first cohabitated below the age of 15. In models 4A and 4B these women had 17% less children ever born.

Women who were involved in household decision-making had 12% more children ever born in model 1C and 14% more children ever born in model 4C, then women who were not involved in household decisions. The 12% in model 1C is 1 percentage point higher than in model 1A and 1B, whilst the 14% in model 4C was the same as model 4A and 1% higher than in model 4B.

The household factors in model 2C and 4C showed almost exactly the same results as model 2B and 2C, and therefore the same differences in model 1B and 1C. The only category which showed both a difference from the models that included no GBV and less severe physical GBV was in model 4C (the full model that included more severe physical GBV) in asymmetry of desired number of children. For this factor, women whose husbands wanted more children than they did had 21% more children than women whose husbands wanted the same number of children – compared to 23% in model 4A and 22% in model 4C.

Similarly, the community level factors showed almost the same results as the B models (model 3B and 4B) in which less severe physical GBV was included, and therefore again – the same differences between models' B and models' A (no GBV) as discussed above. The one difference was amongst women living in the Karamoja region. In model 3C, women living in this region had 32% more children than women living in the Kampala region. The corresponding IRR in model 4A and 4B was 34% and 33%, respectively.

The measures of variation showed exactly the same results as the B models, showing that introducing both less and more severe physical GBV has the same effect on the variation of children ever born.

Table 6.8: Effects of Individual, Household and Community Level Factors on Fertility in Uganda: Multilevel Poisson Incidence Risk Ratios – Models with More Severe Physical GBV [UDHS, 2011]

Characteristics	Model 0 Empty Model IRR	Model IC Individual IRR	Model IIC Household IRR	Model IIIC Community IRR	Model IVC Full IRR
More Severe Physical GBV					
No	**RC**	**RC**	**RC**	**RC**	**RC**
Yes		1.11 *	1.13 *	1.15 *	1.11 *
Reproductive Health Outcomes					
Current Contraceptive Use					
No Method	**RC**	**RC**	**RC**	**RC**	**RC**
Traditional Method		1.23 *	1.21 *	1.22 *	1.27 *
Modern Method		1.08 *	1.02	1.09 *	1.04
Intention of Previous Pregnancy					
Birth Not Planned	**RC**	**RC**	**RC**	**RC**	**RC**
Birth Planned		0.79 *	0.81 *	0.80 *	0.82 *
Ever Had a Pregnancy Terminated					
No	**RC**	**RC**	**RC**	**RC**	**RC**
Yes		1.17 *	1.17 *	1.19 *	1.16 *
Individual Factors					
Ethnicity					
Muganda	**RC**	**RC**	**RC**	**RC**	**RC**
Munyankole		0.94			0.94
Musoga		1.03			1.08
Mukiga		0.97			1.01
Ateso		0.99			1.05
Other		0.97			1.03
Religion					
Catholic	**RC**	**RC**	**RC**	**RC**	**RC**
Protestant		1.07			1.05
Muslim		1.04			1.04
Pentecostal		1.08			1.06
SDA		1.05			0.99
Other		1.07			1.01

Highest Education Level					
No education	**RC**	**RC**	**RC**	**RC**	**RC**
Primary		0.74 *			0.73 *
Secondary		0.53 *			0.55 *
Higher		0.47*			0.48 *
Employment Status					
Not employed	**RC**	**RC**	**RC**	**RC**	**RC**
Employed		1.09 *			1.09 *
Age at First Cohabitation					
Under 15 Years	**RC**	**RC**	**RC**	**RC**	**RC**
15-19 Years		0.85 *			0.84 *
20-24 Years		0.87 *			0.88 *
25 and Above		0.83			0.85
Household Decision-Making					
Women Not Involved in Decision-Making	**RC**	**RC**	**RC**	**RC**	**RC**
Women Involved in Decision-Making		1.12 *			1.14 *
Households Factors					
Wealth Status					
Poorest	**RC**	**RC**	**RC**	**RC**	**RC**
Poorer			0.96		1.03
Middle			0.95		1.07
Richer			1.01		1.17 *
Richest			0.73 *		1.12
Asymmetry for Desired Number of Children					
Both wants the same	**RC**	**RC**	**RC**	**RC**	**RC**
Husband wants more			1.21 *		1.19 *
Husband wants less			1.03		1.00
Don’t know			1.22 *		1.19 *
Community Factors					
Region					
Kampala	**RC**	**RC**	**RC**	**RC**	**RC**
Central 1				1.21 *	1.25 *
Central 2				1.25 *	1.28 *
East Central				1.26 *	1.20
Eastern				1.16	1.19
North				1.09	1.13
Karamoja				1.32 *	1.08
West-Nile				1.14	1.14
Western				1.24 *	1.20
Southwest				1.11	1.20
Place of Residence					
Urban	**RC**	**RC**	**RC**	**RC**	**RC**
Rural				1.26 *	1.20 *
Community Level of Female Education					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				0.95	0.97
High				0.76 *	0.90
Community Level of Wealth					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				1.04	1.03
High				1.09	1.10
Community Level of Less Severe Physical GBV					
Low	**RC**	**RC**	**RC**	**RC**	**RC**
Medium				1.00	0.98
High				1.02	1.02
Community Level of More Severe Physical GBV					
Low	**RC**	**RC**	**RC**	**RC**	**RC**

Random Effects Parameters	Model 0 Empty Model	Model IC Individual	Model IIC Household	Model IIIC Community	Model IVC Full
Medium				0.93	0.94
High				0.98	1.00
Community Level					
Variance (SE)	0.45 (0.03) *	0.04 (0.01) *	0.07 (0.02) *	0.07 (0.01) *	0.02 (0.01) *
VPC = ICC (%)	12.03	1.20	2.08	2.08	0.60
Explained Variation (PCV) (%)	Reference	91.11	84.44	84.44	95.56
Household Level					
Variance (SE)	0.08 (0.02) *	0.01 (0.01) *	0.02 (0.01) *	0.01 (0.01) *	0.01 (0.01) *
VPC = ICC (%)	2.37	0.30	0.60	0.30	0.30
Explained Variation (PCV) (%)	Reference	87.50	75.00	87.50	87.50
Log-Likelihood	-4908.15	-2469.75	-2467.72	-2797.83	-2375.15
AIC	9822.30	4991.50	4965.43	5647.67	4852.30
BIC	9839.19	5122.42	5040.72	5781.38	5108.24

6.4 Summary of the Chapter

Perhaps most pertinent is that the adjusted and multi-level models show the importance of the reproductive health outcomes. Although use of modern contraceptives was not significant as a category, the reproductive health outcomes are significant predictors of children ever born and explain much of the variation in variances in children ever born both between and within communities in Uganda. This is specifically the case for use of traditional methods (which increases children ever born), and intention of most recent pregnancy and ever having had a pregnancy terminated.

Physical GBV, irrespective of the severity, also shows to be a significant predictor of children ever born – moderating the effects of individual-level predictors, and household predictors to a lesser extent. Although community level factors were shown to be significant in the unadjusted models in Chapter 5, once the all factors are controlled for these no longer show a significant relationship with children ever born. Furthermore, only modest changes occur amongst those that experience less and more severe physical GBV and, therefore, from the adjusted and multi-level results one could pre-emptively conclude that irrespective of the severity of the physical abuse the woman endures, the effect on children ever born is evident.

The four individual level factors that consistently show significant relationships with children ever born are educational status of the woman, employment status, age at first cohabitation and whether the women are involved in key household decisions. Religion and ethnicity, contrary to what was found in previous studies elsewhere, does not show a significant effect on children ever born – once other factors at the individual, household and community level are controlled for. This was seen in both the adjusted Poisson models, but also in the Multi-level models.

Amongst the household level factors, only those the above-middle wealth quintiles show significant results with children ever born. Furthermore, husbands who want more children and those where it was not known whether husbands wanted more/the same / less children than their partners also showed significant results with children ever born. On the other hand, the community level factors selected, although significant in the unadjusted models in chapter 5 - do not seem to effect children ever born in a significant way, as shown in both the results of the adjusted and Multi-level Poisson models. The only community-level factor that showed a consistently significant relationship with children ever born in the Multi-level models was place of residence.

Finally, it should be noted that the inclusion of physical GBV in the models altered the effects of the reproductive health outcomes as well as the individual, household and community level factors. It is therefore shown that it is important to include physical GBV as a predictor, but also a moderator, of fertility in Uganda based on the results of the adjusted and multi-level Poisson results.

CHAPTER SEVEN

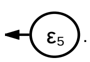
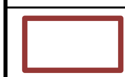
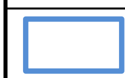
DIRECT AND INDIRECT PATHWAYS IN WHICH GBV AFFECTS FERTILITY IN UGANDA

7.1 Introduction

This chapter presents the results from the pathway analysis. Three models were created to assess the indirect and direct pathways in which the different severities of physical GBV affect fertility, accounting for the exogenous variables (socio-demographic variables) and the endogenous variables (RH outcomes, and each severity of physical GBV in turn). The first model (Figure and Table 7.2) does not include any form of GBV. This was done to assess the difference between exclusion of GBV and inclusion of GBV as an endogenous variable in the subsequent models. Thereafter, less severe physical and more severe physical GBV are included to model 2 (Figure and Table 7.3) and 3 (Figure and Table 7.4), respectively.

Table 7.1 below shows the key for variable codes and names, as well the key schematic used in the path diagrams. As mentioned in Chapter 3, variables included were selected based on the theory available on fertility and GBV, the conceptual model, as well as the results in the previous chapters (regression and Multi-level models) which showed the possible relationships between the socio-demographic factors (or exogenous variables) with both GBV and fertility. Those found to consistently show a relationship with GBV and fertility, as well as those that did not show possible collinearity, were selected for the models.

Table 7.1: Variable Codes and Names and Path Diagram Key

Code	Variable Name / Description
V201	Children ever born
d106	Less Severe Physical GBV
d107	More Severe Physical GBV
unintpreg	Planning status of most recent pregnancy
currcontmeth	Current method of contraception
v228	Ever had stillbirth, miscarriage or abortion
V106	Highest education level
V025	Place of Residence [Rural / Urban]
V190	Wealth index
V621	Asymmetry of Desired Number of Children
employstat	Employment status
agecatcohab	Age at First Cohabitation
HhdDM	Involvement in household decision-making
Key Schematic	**Description**
	Pathway from endogenous to exogenous and outcome
	Pathways from exogenous to outcome
	Pathways from outcome to exogenous
	Covariance
	Error term
	Observed outcome variables
	Observed exogenous variables
	Observed endogenous variables

7.2 Direct and Indirect Pathways of GBV on Fertility in Uganda

All path coefficients were assessed for significance at the 0.05 significance level, using a t-test. Removal of non-significant pathways had little effect on the model and the path coefficients but did change whether the model was a reasonable fit – and therefore, non-significant pathways were kept in the models below. The pathway figures allow readers to conceptually visualise the pattern of the direct and indirect effects.

Figure 7.1 and table 7.2 show the results of the pathway model for fertility in which no GBV variable is included as an endogenous factor. The figure and table present the direct, indirect and total effects of the exogenous or socio-demographic factors, and their effect on the exogenous factors (the RH outcomes and children ever born). In this first model, 38 out of the total 62 hypothesised pathways were significant at the 0.05 significance level.

Under the total effects one sees that employment status was the only factor that did not have a significant effect in totality on current contraceptive use. Age at first cohabitation, partner asymmetry in desired number of children, and place of residence all showed significant negative total effected on current contraceptive use; while household wealth and educational status had positive total effects. Therefore, women who first cohabitate at young ages have more probability of being on traditional or modern forms of contraception currently. Furthermore, women who have husbands who want the same number of children as they do and women living in urban areas have a higher probability of currently being on contraception. On the other hand, as wealth of the household increases, and educational status of the women increases, so does the likelihood of those women be on traditional or modern forms of contraception currently. The factor showing the highest coefficient (-0.29) was place of residence, followed by household wealth (0.10) and educational level (0.09).

The total effects on planning status of previous pregnancy shows a negative relationship with household wealth status and current use of contraception; but a positive relationship with age at first cohabitation, asymmetry of partner's desired number of children, and place of residence. In other words, as household wealth increases the probability that the previous pregnancy was not planned decreases. Furthermore, women who are not currently using contraception have a lower probability of having planned their previous pregnancy. On the other hand, as age at first cohabitation increases the probability that the previous pregnancy was planned increases as well. Women whose partners want the same number of children as they do have a higher probability of having planned their previous pregnancy. Finally, women living in urban areas show a higher probability that the previous pregnancy was planned than women living in rural areas. The factor showing the highest coefficient was current use of contraceptive (-0.06), followed by age at first cohabitation (0.04).

Finally, the total effect on children ever born show that in totality age at first cohabitation and asymmetry of partner's desired number of children were not significant to children ever born – although they were significant to two out of the three reproductive health outcomes. Planning status of previous pregnancy and educational level had negative effects on children ever born in total. As such, women whose previous pregnancies were planned and women with higher levels of education all had fewer children than women who had not planned their previous pregnancies and who had lower levels of education, respectively. On the other hand, current use of contraception, ever having had a pregnancy terminated, household wealth, women's involvement in household decisions and place of residence all showed a positive total effect on children ever born. In other words, women who were currently on contraception, who ever had a pregnancy terminated, those living in rural areas, women who were involved in household decisions and women in lower wealth households all had more children than their counterparts. Major predictors included educational level (-1.23), planning status of previous pregnancy (-0.92), place of residence (0.83), ever having had a pregnancy terminated (0.74) and whether women were involved in household decisions (0.47).

The interlinked relationships between the different endogenous and exogenous factors provide a complex interplay in which some factors work to depress fertility, whilst the existence of others increase fertility in total. It is therefore, also important to review the indirect and direct effects of the included factors on each of the endogenous factors, but also on fertility itself. The direct and indirect relationships between the endogenous and exogenous factors are best visualised using the path diagram (figure 7.1). Only significant effects are reported.

Amongst the exogenous factors, firstly asymmetry of desired number of children has a significant positive direct effect 0.05 on children ever born, but a significant indirect effect moderated through planning status of previous pregnancy of -0.01. On the other hand, age at first cohabitation has no direct effect on children ever born – the effect of age at first cohabitation works through its effect on current contraceptive method (-0.07).

Educational status does have a direct negative effect -1.25 on children ever born, but also affects children ever born through its positive effect on current contraceptive use (0.09). Household wealth status also acts positively and directly (0.19) on children ever born, but also works through negative effect on planning status of previous pregnancy (-0.01). Place of residence has a positive direct effect on children ever born (0.89), but a negative effect through current use of contraception -0.28. Finally, women's involvement in household decisions has a positive direct effect on children ever born 0.49 – which is not what one would expect.

The fit statistics for this model show a Root Mean Squared Error of Approximation (RMSEA) of less than 0.02, a Comparative Fit Index (CFI) of 0.99, and the TLI value is 0.97. Furthermore, the Standardised Root Mean Squared Residual (SRMR) is 0.01. The RMSEA and the SRMR of below 0.5, and the CFI and TLI of above 0.9 show a reasonably good model fit. The p-value of the log-likelihood is higher than 0.05 which re-iterates that the model is reasonably well fitted.

Furthermore, the Coefficient of Determination (CD) for the equation level goodness of fit shows that the included predictors explain 26% of the variation in children ever born amongst women of reproductive age in Uganda. In total, however, the biggest contributors to children ever born in Uganda are the three RH outcomes (although specifically planning status of previous pregnancy and ever having had a pregnancy terminated), place of residence and educational status; followed by household decision-making and household wealth status. As a total effect age at first cohabitation, employment status and asymmetry of desired number of children were not significant factors.

Table 7.2: Results of Pathway Analysis to Past Fertility with no GBV [UDHS, 2011]

	Coefficient	Standardised Coefficient	P-Value	95% CI	
DIRECT EFFECTS					
Current Contraceptive Method <-					
agecatcohab	-0.08	0.04	0.03	-0.15	-0.01
v190	0.10	0.02	0.00	0.06	0.14
v106	0.09	0.04	0.03	0.01	0.17
employstat	0.09	0.05	0.08	-0.01	0.20
v621	-0.03	0.01	0.00	-0.05	-0.02
v025	-0.28	0.07	0.00	-0.43	-0.14
Planning Status of Previous Pregnancy <-					
currcontmeth	-0.06	0.02	0.00	-0.09	-0.02

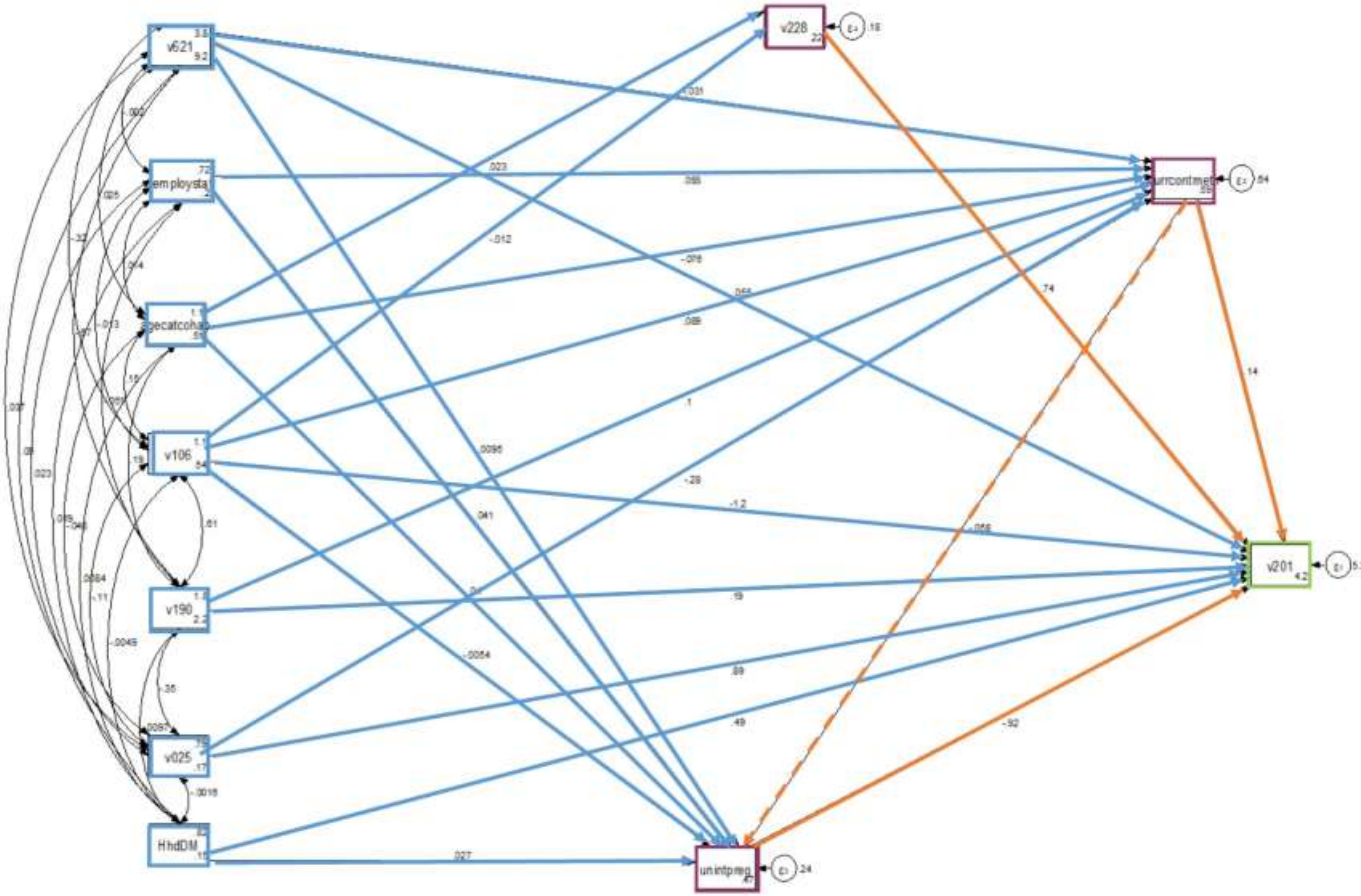
agecatcohab	0.04	0.02	0.07	-0.00	0.08
v106	-0.01	0.02	0.80	-0.05	0.04
HhdDM	0.03	0.04	0.49	-0.05	0.10
employstat	0.04	0.03	0.21	-0.02	0.11
v621	0.01	0.00	0.05	-0.00	0.02
Ever Terminated a Pregnancy <-					
agecatcohab	0.02	0.02	0.22	-0.01	0.06
v106	-0.01	0.02	0.52	-0.05	0.02
Children Ever Born <-					
currcontmeth	0.14	0.09	0.10	-0.03	0.31
unintpreg	-0.92	0.14	0.00	-1.20	-0.65
v228	0.74	0.16	0.00	0.42	1.06
v190	0.19	0.07	0.00	0.06	0.32
v106	-1.25	0.11	0.00	-1.47	-1.02
HhdDM	0.49	0.18	0.01	0.14	0.85
v621	0.05	0.02	0.02	0.01	0.10
v025	0.89	0.21	0.00	0.48	1.30
INDIRECT EFFECTS					
Planning Status of Previous Pregnancy <-					
agecatcohab	0.00	0.00	0.07	-0.00	0.01
v190	-0.01	0.00	0.01	-0.010	-0.00
v106	-0.01	0.00	0.07	-0.01	0.00
employstat	-0.01	0.00	0.13	-0.01	0.00
v621	0.00	0.00	0.01	0.00	0.00
v025	0.02	0.01	0.01	0.00	0.03
Children Ever Born <-					
currcontmeth	0.05	0.02	0.00	0.02	0.09
agecatcohab	-0.03	0.03	0.20	-0.09	0.02
v190	0.02	0.01	0.05	0.00	0.04
v106	0.01	0.03	0.60	-0.04	0.06
HhdDM	-0.02	0.04	0.49	-0.09	0.05
employstat	-0.02	0.03	0.56	-0.09	0.05
v621	-0.01	0.01	0.01	-0.03	-0.00
v025	-0.06	0.03	0.05	-0.11	0.00
TOTAL EFFECTS					
Current Contraceptive Method <-					
agecatcohab	-0.08	0.04	0.03	-0.15	-0.01
v190	0.10	0.02	0.00	0.06	0.14
v106	0.09	0.04	0.03	0.01	0.17
employstat	0.09	0.05	0.08	-0.01	0.20
v621	-0.03	0.01	0.00	-0.05	-0.02
v025	-0.29	0.07	0.00	-0.43	-0.14
Planning Status of Previous Pregnancy <-					
currcontmeth	-0.06	0.02	0.00	-0.09	-0.02
agecatcohab	0.04	0.02	0.04	0.00	0.09
v190	-0.01	0.00	0.01	-0.01	-0.00
v106	-0.00	0.02	0.62	-0.05	0.03
HhdDM	0.03	0.04	0.49	-0.05	0.10
employstat	0.04	0.03	0.28	-0.03	0.10
v621	0.01	0.00	0.02	0.00	0.02
v025	0.02	0.01	0.01	0.00	0.03
Ever Terminated a Pregnancy <-					
agecatcohab	0.02	0.02	0.22	-0.01	0.06
v106	-0.01	0.02	0.52	-0.05	0.02

Children Ever Born <-					
currcontmeth	0.19	0.09	0.03	0.02	0.37
unintpreg	-0.92	0.14	0.00	-1.20	-0.65
v228	0.74	0.16	0.00	0.42	1.06
agecatcohab	-0.03	0.03	0.20	-0.09	0.02
v190	0.21	0.06	0.00	0.08	0.34
v106	-1.23	0.12	0.00	-1.46	-1.01
HhdDM	0.47	0.18	0.01	0.11	0.83
employstat	-0.02	0.03	0.56	-0.09	0.05
v621	0.04	0.02	0.09	-0.01	0.09
v025	0.83	0.21	0.00	0.43	1.24

MODEL FIT STATISTICS			
Likelihood ratio			
Model Vs. Saturated	15.77		
Population error			
RMSEA	0.02		
Information criteria			
AIC	27721.80	BIC	28131.49
Baseline comparison			
CFI	0.99	TLI	0.97
Size of residuals			
SRMR	0.01	CD	0.26

RMSEA = Root mean squared error of approximation
CFI = Comparative Fit Index
TLI = Tucker Lewis Index
SRMR = Standardised Root Mean Squared Residual
CD = Coefficient of Determination

Figure 7.1: Pathway Analysis to Fertility with no GBV [UDHS, 2011]



The results of the second model are shown in Table 7.3 and Figure 7.2 below. The second path model includes less severe physical GBV as a moderator factor. Out of the 77 hypothesised pathways, 55 were seen to significant in model 2.

Under the total effects age at first cohabitation, educational status and place of residence all have significant direct effects on less severe physical GBV. However, place of residence is the only factor that has a positive effect on this severity of GBV. In other words, women living in rural areas have higher probability of ever experience of less severe physical GBV. On the other hand, as age at first cohabitation increases and educational level of the woman increases, the probability of ever experience of physical GBV decreases. All factors have similar effects in terms of their magnitude, while the coefficient for age at first cohabitation is -0.08 and educational status is -0.07, the coefficient for place of residence is 0.08.

The results for the total effects on current contraceptive use remained as it was in the first model, which did not contain less severe physical GBV. As such, age at first cohabitation, partner asymmetry in desired number of children, and place of residence all showed significant negative total effected on current contraceptive use; while household wealth and educational status had positive total effects. Therefore, women who first cohabitate at young ages have more probability of being on traditional or modern forms of contraception currently. Furthermore, women who have husbands who want the same number of children as they do and women living in urban areas have a higher probability of currently being on contraception. On the other hand, as wealth of the household increases, and educational status of the women increases, so does the likelihood of those women be on traditional or modern forms of contraception currently. The factor showing the highest coefficient (-0.29) was place of residence, followed by household wealth (0.10) and educational level (0.09).

The total effects on planning status of previous pregnancy shows a negative relationship with ever experience of less severe physical GBV and current use of contraception, as well as with household wealth and educational status (though the magnitude of the last two were negligible given that the coefficients were <0.01). Furthermore, age at first cohabitation, asymmetry of partner’s desired number of children and place of residence all had positive total effects on planning status of previous pregnancy. However, like household wealth and educational status the coefficient of place of residence and asymmetry of partner’s desired number of children was negligible. Therefore, women who ever experienced less severe physical GBV and women on either traditional or modern forms of contraception show a lower probability of having planned their previous pregnancy. As age at first cohabitation increases the probability that the previous pregnancy was planned increases as well. Less severe physical GBV showed a highest coefficient (-0.08).

Also, unlike what was seen in model 1, which did not have any significant path coefficients for the total effects with ever having had a pregnancy terminated, experience of less severe physical GBV showed a positive direct effect on this reproductive health outcome. Women who experienced less severe physical GBV had a higher likelihood of ever having had a pregnancy terminated (0.08). On the other hand, as age at first cohabitation increased and educational status increased the probability of ever having experienced a termination of pregnancy decreased, each with a coefficient value of 0.01.

Finally, the total effect on children ever born show that in totality less severe physical GBV, current contraceptive method, ever having had a pregnancy terminated, household wealth status, women’s involvement in household decisions, asymmetry of partner’s desired number of children, and place of residence all had positive total effects on children ever born. On the other hand, age at first cohabitation, educational status and planning status of previous pregnancy had negative total effects on children ever born. The most important factors (in order of importance) were educational level (-1.25), planning status of previous pregnancy (-0.90), place of residence (0.87), ever having had a pregnancy terminated (0.70), followed by women’s involvement in household decisions (0.48) and ever experience of less severe physical GBV (0.46).

The direct and indirect effects shown in table 7.3 show that amongst the exogenous factors, asymmetry of desired number of children has a significant positive direct effect 0.06 on children ever born, but a significant indirect effect moderated through current use of contraceptives of -0.03. On the other hand, age at first cohabitation has no direct effect on children ever born – the effect of age at first cohabitation works through its effect on current contraceptive method (-0.07), less severe physical GBV (0.08) and planning status of previous pregnancy (0.03).

Educational status does have a direct negative effect -1.2 on children ever born, but also affects children ever born through its positive effect on current contraceptive use (0.06) and less severe physical GBV (0.07). Household wealth status also acts positively and directly (0.21) on children ever born, but also works through positive effect on current contraceptive use (0.1). Place of residence has a positive direct effect on children ever born (0.89), but a negative effect through current use of contraception -0.28 but a positive effect through less severe physical GBV (0.08). Finally, as in model 1 - women's involvement in household decisions has a positive direct effect on children ever born 0.49.

The fit statistics for this model show a Root Mean Squared Error of Approximation (RMSEA) of 0.04, a Comparative Fit Index (CFI) of 0.93, and the TLI value is 0.90. Furthermore, the Standardised Root Mean Squared Residual (SRMR) is 0.02. The RMSEA and the SRMR of below 0.5, and the CFI and TLI of above 0.9 show a reasonably good model fit, even though the log-likelihood is less than 0.05. Furthermore, by including less severe physical GBV in the model, the Coefficient of Determination (CD) for the equation level goodness of fit shows that the included predictors explain 28% of the variation in children ever born amongst women of reproductive age in Uganda – 2% higher than the model where no GBV is included.

Although all factors, except employment status, were significant in total – some key factors were the largest contributors to children ever born in Uganda. In order of importance, these were educational status, planning status of previous pregnancy (one of the RH outcomes), place of residence, ever having had a pregnancy terminated, following by women's involvement in household decisions and women's experience of less severe physical GBV. Age at first cohabitation and asymmetry of desired number of children, though no less important, were the least largest contributors on the effect on children ever born.

Table 7.3: Results of Pathway Analysis to Past Fertility with Less Severe Physical GBV [UDHS, 2011]

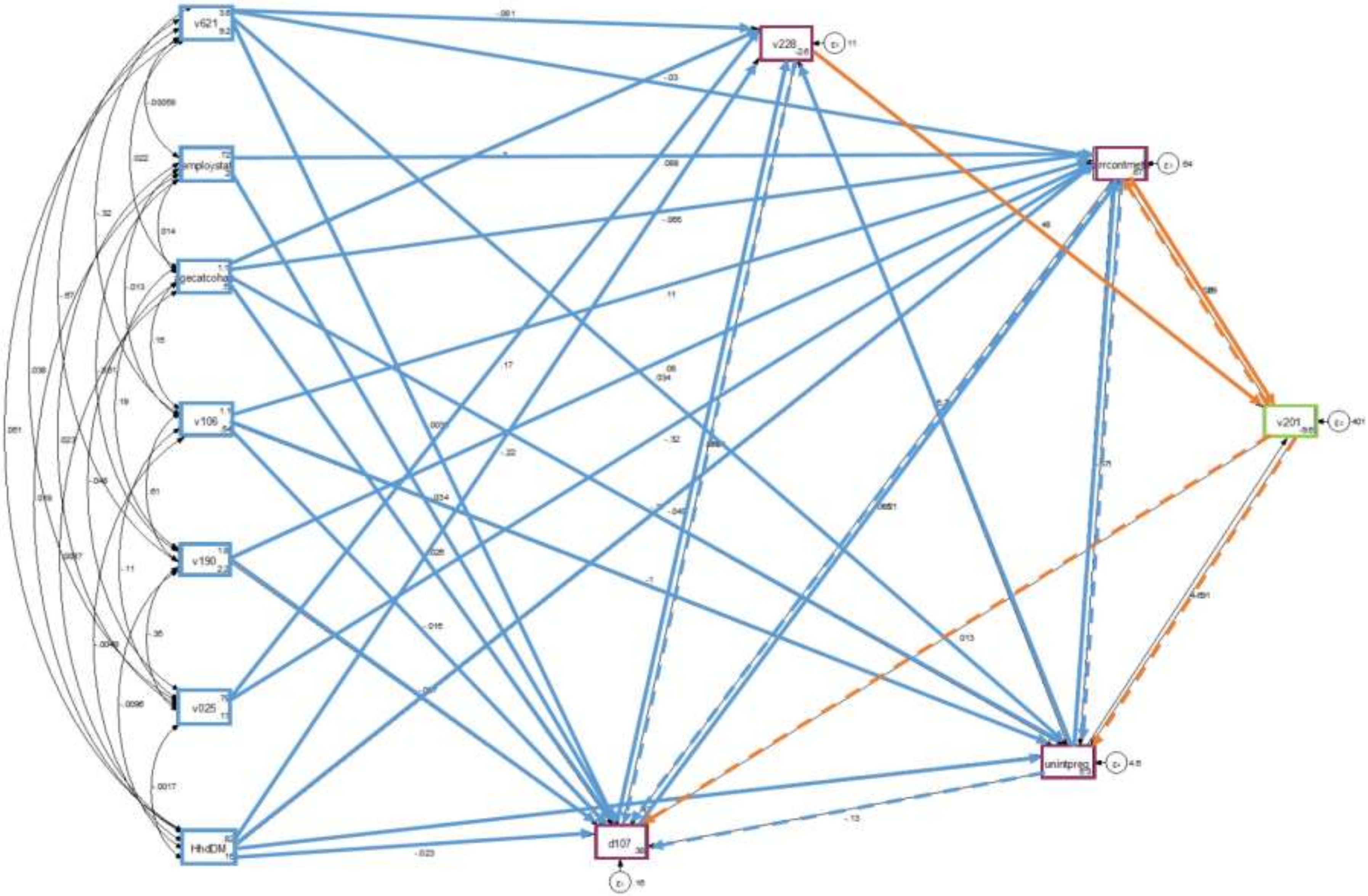
	Coefficient	Standardised Coefficient	P-Value	95% CI	
DIRECT EFFECTS					
Less Severe Physical GBV <-					
agecatcohab	-0.08	0.02	0.00	-0.12	-0.03
v106	-0.07	0.02	0.00	-0.11	-0.03
v025	0.08	0.04	0.03	0.01	0.16
Current Contraceptive Method <-					
agecatcohab	-0.07	0.04	0.04	-0.14	-0.00
v190	0.10	0.02	0.00	0.06	0.14
v106	0.09	0.04	0.03	0.01	0.17
HhdDM	-0.04	0.06	0.56	-0.16	0.09
employstat	0.10	0.05	0.08	-0.01	0.20
v621	-0.03	0.01	0.00	-0.05	-0.01
v025	-0.29	0.07	0.00	-0.43	-0.15
Planning Status of Previous Pregnancy <-					
d106	-0.08	0.03	0.01	-0.14	-0.02
currcontmeth	-0.07	0.02	0.00	-0.10	-0.03
agecatcohab	0.03	0.02	0.12	-0.01	0.07
employstat	0.04	0.03	0.20	-0.02	0.11
Ever Terminated a Pregnancy <-					
d106	0.08	0.03	0.00	0.03	0.13
Children Ever Born <-					
d106	0.34	0.15	0.02	0.05	0.62
currcontmeth	0.14	0.09	0.10	-0.03	0.31
unintpreg	-0.90	0.14	0.00	-1.17	-0.62
v228	0.70	0.16	0.00	0.38	1.02
v190	0.21	0.07	0.00	0.09	0.34
v106	-1.24	0.11	0.00	-1.46	-1.01
HhdDM	0.49	0.18	0.01	0.14	0.84
v621	0.06	0.02	0.02	0.01	0.10
v025	0.89	0.21	0.00	0.49	1.30
INDIRECT EFFECTS					
Planning Status of Previous Pregnancy <-					
agecatcohab	0.01	0.00	0.01	0.00	0.02
v190	-0.01	0.00	0.00	-0.01	-0.00
v106	-0.00	0.00	0.82	-0.01	0.01
HhdDM	0.00	0.00	0.56	-0.01	0.01
employstat	-0.01	0.00	0.11	-0.01	0.00
v621	0.00	0.00	0.01	0.00	0.00
v025	0.01	0.01	0.09	-0.00	0.03
Ever had a Pregnancy Terminated <-					
agecatcohab	-0.01	0.00	0.02	-0.01	-0.00
v106	-0.01	0.00	0.03	-0.01	-0.00
v025	0.01	0.00	0.08	-0.00	0.01
Children Ever Born <-					
d106	0.12	0.03	0.00	0.06	0.19
currcontmeth	0.06	0.02	0.00	0.03	0.09
agecatcohab	-0.08	0.03	0.00	-0.13	-0.03
v190	0.02	0.01	0.04	0.00	0.04
v106	-0.01	0.02	0.46	-0.05	0.02
HhdDM	-0.01	0.01	0.57	-0.03	0.02
employstat	-0.02	0.03	0.58	-0.08	0.05

v621	-0.01	0.00	0.05	-0.01	-0.00
v025	-0.02	0.04	0.57	-0.09	0.05
TOTAL EFFECTS					
Less Severe Physical GBV <-					
agecatcohab	-0.08	0.02	0.00	-0.12	-0.03
v106	-0.07	0.02	0.00	-0.11	-0.03
v025	0.08	0.04	0.03	0.01	0.16
Current Contraceptive Method <-					
agecatcohab	-0.07	0.04	0.04	-0.14	-0.00
v190	0.10	0.02	0.00	0.06	0.14
v106	0.09	0.04	0.03	0.01	0.17
HhdDM	-0.04	0.06	0.56	-0.16	0.09
employstat	0.10	0.05	0.08	-0.01	0.20
v621	-0.03	0.01	0.00	-0.05	-0.01
v025	-0.29	0.07	0.00	-0.43	-0.15
Planning Status of Previous Pregnancy <-					
d106	-0.08	0.03	0.01	-0.14	-0.02
currcontmeth	-0.07	0.02	0.00	-0.10	-0.03
agecatcohab	0.04	0.02	0.04	0.00	0.08
v190	-0.01	0.00	0.00	-0.01	-0.00
v106	-0.00	0.00	0.82	-0.01	0.01
HhdDM	0.00	0.00	0.56	-0.01	0.01
employstat	0.03	0.03	0.29	-0.03	0.10
v621	0.00	0.00	0.01	0.00	0.00
v025	0.01	0.01	0.09	-0.00	0.03
Ever Terminated a Pregnancy <-					
d106	0.08	0.03	0.00	0.03	0.13
agecatcohab	-0.01	0.00	0.02	-0.01	-0.00
v106	-0.01	0.00	0.03	-0.01	-0.00
v025	0.01	0.00	0.08	-0.00	0.01
Children Ever Born <-					
d106	0.46	0.15	0.00	0.17	0.75
currcontmeth	0.20	0.09	0.02	0.03	0.37
unintpreg	-0.90	0.14	0.00	-1.17	-0.62
v228	0.70	0.16	0.00	0.38	1.02
agecatcohab	-0.08	0.03	0.00	-0.13	-0.03
v190	0.24	0.07	0.00	0.11	0.36
v106	-1.25	0.11	0.00	-1.47	-1.02
HhdDM	0.48	0.18	0.01	0.13	0.84
employstat	-0.02	0.03	0.58	-0.08	0.05
v621	0.05	0.02	0.03	0.00	0.10
v025	0.87	0.21	0.00	0.46	1.28

MODEL FIT STATISTICS			
Likelihood ratio			
Model Vs. Saturated	52.08*		
Population error			
RMSEA	0.04		
Information criteria			
AIC	29297.16	BIC	29643.50
Baseline comparison			
CFI	0.93	TLI	0.90
Size of residuals			
SRMR	0.02	CD	0.28

RMSEA = Root mean squared error of approximation
CFI = Comparative Fit Index
TLI = Tucker Lewis Index
SRMR = Standardised Root Mean Squared Residual
CD = Coefficient of Determination

Figure 7.2: Pathway Analysis to Fertility with Less Severe Physical GBV [UDHS, 2011]



The final path mode, Model 3, includes more severe physical GBV as opposed to no GBV (model 1) and more severe physical GBV (model 2). Results for model 3 are shown in Table 7.4 and Figure 7.3 below. Out of 77 hypothesised pathways, 49 were found to be significant.

Under the total effects age at first cohabitation, educational status and place of residence all have significant direct effects on more severe physical GBV. However, place of residence is the only factor that has a positive effect on this severity of GBV. In other words, women living in rural areas have higher probability of ever experience of more severe physical GBV. On the other hand, as age at first cohabitation increases and educational level of the woman increases, the probability of ever experience of physical GBV decreases. The most important contributor was place of residence (0.09), followed by educational status (-0.07) and age at first cohabitation (-0.04).

The results for the total effects on current contraceptive use remained as it was in the first two models, which did not contain more severe physical GBV. As such, age at first cohabitation, partner asymmetry in desired number of children, and place of residence all showed significant negative total effected on current contraceptive use; while household wealth and educational status had positive total effects. Therefore, women who first cohabitate at young ages have more probability of being on traditional or modern forms of contraception currently. Furthermore, women who have husbands who want the same number of children as they do and women living in urban areas have a higher probability of currently being on contraception. On the other hand, as wealth of the household increases, and educational status of the women increases, so does the likelihood of those women be on traditional or modern forms of contraception currently. The factor showing the highest coefficient (-0.29) was place of residence, followed by household wealth (0.10) and educational level (0.09).

As in model 2, the total effects on planning status of previous pregnancy shows a negative relationship with ever experience of more severe physical GBV and current use of contraception, as well as with household wealth and educational status (though the magnitude of the last two were negligible given that the coefficients were <0.01). Furthermore, age at first cohabitation, asymmetry of partner's desired number of children and place of residence all had positive total effects on planning status of previous pregnancy. However, like household wealth and educational status the coefficient of place of residence and asymmetry of partner's desired number of children was negligible. Therefore, women who ever experienced more severe physical GBV and women on either traditional or modern forms of contraception show a lower probability of having planned their previous pregnancy. As age at first cohabitation increases the probability that the previous pregnancy was planned increases as well. More severe physical GBV showed a highest coefficient (-0.07).

Finally, the total effect on children ever born show that in totality more severe physical GBV, current contraceptive method, ever having had a pregnancy terminated, household wealth status, women's involvement in household decisions, asymmetry of partner's desired number of children, and place of residence all had positive total effects on children ever born. On the other hand, age at first cohabitation, educational status and planning status of previous pregnancy had negative total effects on children ever born.

The most important factors (in order of importance) were educational level (-1.25), planning status of previous pregnancy (-0.90), place of residence (0.88), ever having had a pregnancy terminated (0.72), followed by ever experience of more severe physical GBV (0.60) women's involvement in household decisions (0.50).

Unlike what was seen in model 2, there were no significant total effects with ever having had a pregnancy terminated.

The direct and indirect effects shown in table 7.4 show that amongst the exogenous factors, asymmetry of desired number of children has a significant positive direct effect 0.05 on children ever born, but a significant indirect effect moderated through current use of contraceptives of -0.03. On the other hand, age at first cohabitation has no direct effect on children ever born – the effect of age at first cohabitation works through its effect on current contraceptive method (-0.07), more severe physical GBV (0.04) and planning status of previous pregnancy (0.03).

Educational status does have a direct negative effect -1.2 on children ever born, but also affects children ever born through its positive effect on current contraceptive use (0.09) and more severe physical GBV (0.07). Household wealth status also acts positively and directly (0.22) on children ever born, but also works through positive effect on current contraceptive use (0.1). Place of residence has a positive direct effect on children ever born (0.88), but a negative effect through current use of contraception -0.29 but a positive effect through more severe physical GBV (0.09). Finally, as in model 1 and 2 - women's involvement in household decisions has a positive direct effect on children ever born 0.51.

The fit statistics for this model show a Root Mean Squared Error of Approximation (RMSEA) of 0.04, a Comparative Fit Index (CFI) of 0.94, and the TLI value is 0.90. Furthermore, the Standardised Root Mean Squared Residual (SRMR) is 0.02. The RMSEA and the SRMR of below 0.5, and the CFI and TLI of above 0.9 show a reasonably good model fit, even though the log-likelihood is less than 0.05. Furthermore, by including more severe physical GBV in the model, the Coefficient of Determination (CD) for the equation level goodness of fit shows that the included predictors explain 28% of the variation in children ever born amongst women of reproductive age in Uganda – 2% higher than the model where no GBV is included and the same as the model in which less severe GBV is included.

Table 7.4: Results of Pathway Analysis to Past Fertility with More Severe Physical GBV [UDHS, 2011]

	Coefficient	Standardised Coefficient	P-Value	95% CI	
DIRECT EFFECTS					
More Severe Physical GBV <-					
agecatcohab	-0.04	0.02	0.03	-0.07	-0.00
v106	-0.07	0.02	0.00	-0.11	-0.04
v025	0.09	0.03	0.00	0.03	0.15
Current Contraceptive Method <-					
agecatcohab	-0.07	0.04	0.04	-0.14	-0.00
v190	0.10	0.02	0.00	0.06	0.14
v106	0.09	0.04	0.03	0.01	0.17
HhdDM	-0.04	0.06	0.56	-0.16	0.09
employstat	0.10	0.05	0.08	-0.01	0.20
v621	-0.03	0.01	0.00	-0.05	-0.02
v025	-0.29	0.07	0.00	-0.43	-0.15
Planning Status of Previous Pregnancy <-					
d107	-0.07	0.04	0.04	-0.15	-0.00
currcontmeth	-0.07	0.02	0.00	-0.10	-0.03
agecatcohab	0.03	0.02	0.09	-0.01	0.08
employstat	0.04	0.03	0.19	-0.02	0.11
Ever Terminated a Pregnancy <-					
d107	0.05	0.03	0.09	-0.01	0.11
Children Ever Born <-					
d107	0.50	0.17	0.01	0.15	0.84
currcontmeth	0.13	0.09	0.12	-0.04	0.30
unintpreg	-0.90	0.14	0.00	-1.18	-0.63
v228	0.72	0.16	0.00	0.40	1.04
v190	0.22	0.07	0.00	0.10	0.35
v106	-1.23	0.11	0.00	-1.45	-1.01

HhdDM	0.51	0.18	0.00	0.16	0.86
v621	0.05	0.02	0.02	0.01	0.10
v025	0.88	0.21	0.00	0.48	1.29
INDIRECT EFFECTS					
Planning Status of Previous Pregnancy <-					
agecatcohab	0.01	0.00	0.02	0.00	0.01
v190	-0.01	0.00	0.00	-0.01	-0.00
v106	-0.00	0.00	0.88	-0.09	0.01
HhdDM	0.00	0.00	0.57	-0.01	0.01
employstat	-0.01	0.00	0.11	-0.01	0.00
v621	0.00	0.00	0.01	0.00	0.00
v025	0.01	0.01	0.11	-0.00	0.03
Ever Terminated a Pregnancy <-					
agecatcohab	-0.00	0.00	0.18	-0.00	0.00
v106	-0.00	0.00	0.11	-0.01	0.00
v025	0.00	0.00	0.14	-0.00	0.01
Children Ever Born <-					
d107	0.11	0.04	0.01	0.03	0.18
currcontmeth	0.06	0.02	0.00	0.03	0.09
agecatcohab	-0.07	0.02	0.01	-0.12	-0.02
v190	0.02	0.01	0.05	0.00	0.04
v106	-0.03	0.02	0.20	-0.07	0.01
HhdDM	-0.01	0.01	0.57	-0.03	0.02
employstat	-0.02	0.03	0.54	-0.08	0.04
v621	-0.01	0.00	0.05	-0.01	0.00
v025	-0.00	0.04	0.98	-0.08	0.07
TOTAL EFFECTS					
More Severe Physical GBV <-					
agecatcohab	-0.04	0.02	0.03	-0.07	-0.00
v106	-0.07	0.02	0.00	-0.11	-0.04
v025	0.09	0.03	0.00	0.03	0.15
Current Contraceptive Method <-					
agecatcohab	-0.07	0.04	0.04	-0.14	-0.00
v190	0.10	0.02	0.00	0.06	0.14
v106	0.09	0.04	0.03	0.01	0.17
HhdDM	-0.04	0.06	0.56	-0.16	0.09
employstat	0.10	0.05	0.08	-0.01	0.20
v621	-0.03	0.01	0.00	-0.05	-0.02
v025	-0.29	0.07	0.00	-0.43	-0.15
Planning Status of Previous Pregnancy <-					
d107	-0.07	0.04	0.04	-0.15	-0.00
currcontmeth	-0.07	0.02	0.00	-0.10	-0.03
agecatcohab	0.04	0.02	0.04	0.00	0.08
v190	-0.01	0.00	0.00	-0.01	-0.00
v106	-0.00	0.00	0.88	-0.01	0.01
HhdDM	0.00	0.00	0.57	-0.01	0.01
employstat	0.04	0.03	0.27	-0.03	0.10
v621	0.00	0.00	0.01	0.00	0.00
v025	0.01	0.01	0.11	-0.00	0.03
Ever Terminated a Pregnancy <-					
d107	0.05	0.03	0.09	-0.01	0.11
agecatcohab	-0.00	0.00	0.18	-0.00	0.00
v106	-0.00	0.00	0.11	-0.01	0.00
v025	0.00	0.00	0.14	-0.00	0.01

Children Ever Born <-					
d107	0.60	0.18	0.00	0.25	0.95
currcontmeth	0.19	0.09	0.03	0.02	0.37
unintpreg	-0.90	0.14	0.00	-1.18	-0.63
v228	0.72	0.16	0.00	0.40	1.04
agecatcohab	-0.07	0.02	0.01	-0.12	-0.02
v190	0.24	0.07	0.00	0.11	0.34
v106	-1.25	0.11	0.00	-1.48	-1.03
HhdDM	0.50	0.18	0.01	0.15	0.85
employstat	-0.02	0.03	0.54	-0.08	0.04
v621	0.05	0.02	0.04	0.00	0.09
v025	0.88	0.21	0.00	0.47	1.29
MODEL FIT STATISTICS					
Likelihood ratio					
Model Vs. Saturated		50.68*			
Population error					
RMSEA		0.04			
Information criteria					
AIC		28865.57	BIC		29211.84
Baseline comparison					
CFI		0.94	TLI		0.90
Size of residuals					
SRMR		0.02	CD		0.28

RMSEA = Root mean squared error of approximation

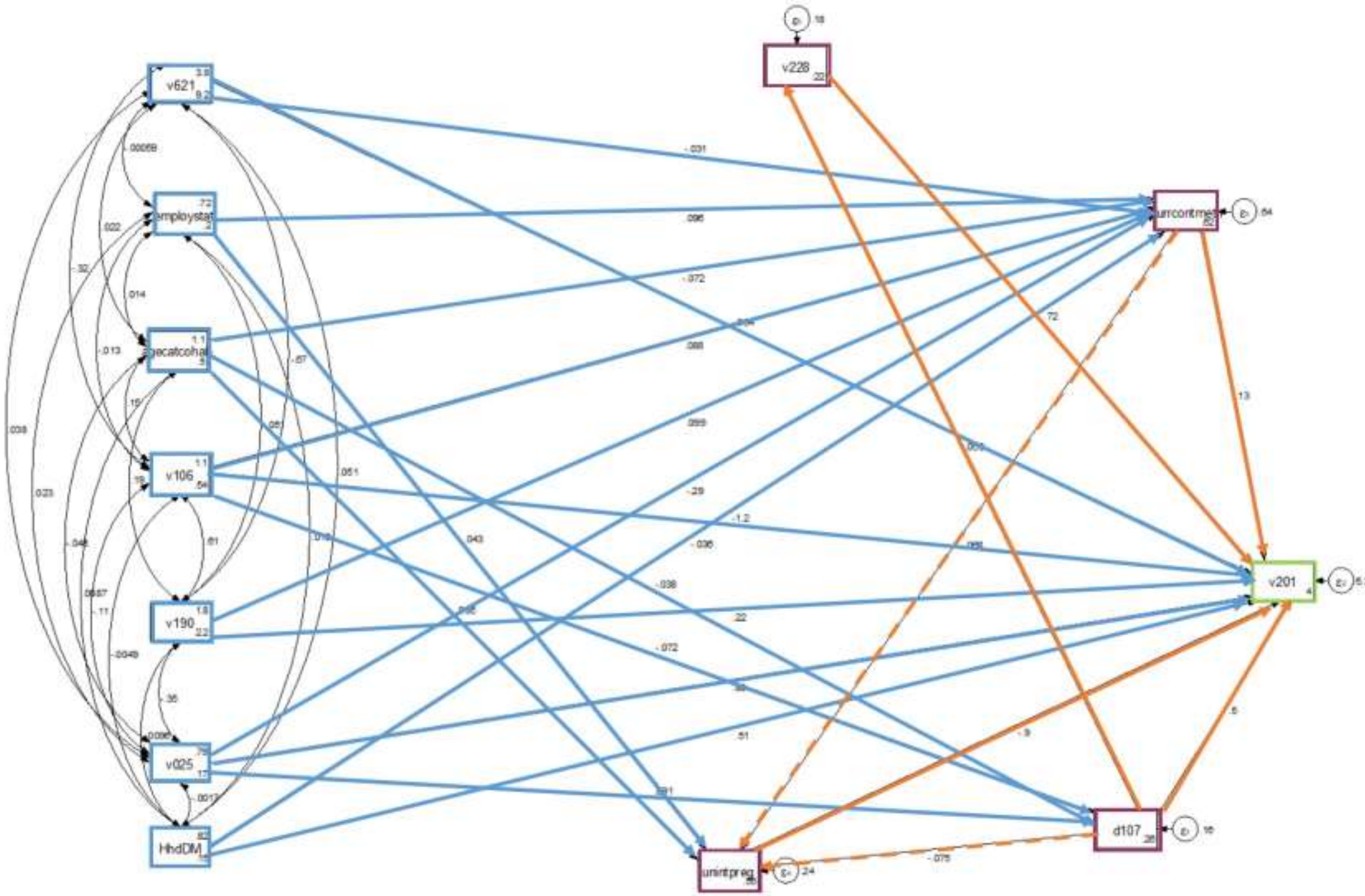
CFI = Comparative Fit Index

TLI = Tucker Lewis Index

SRMR = Standardised Root Mean Squared Residual

CD = Coefficient of Determination

Figure 7.3: Pathway Analysis to Past Fertility with More Severe Physical GBV [UDHS, 2011]



7.3 Summary of the Chapter

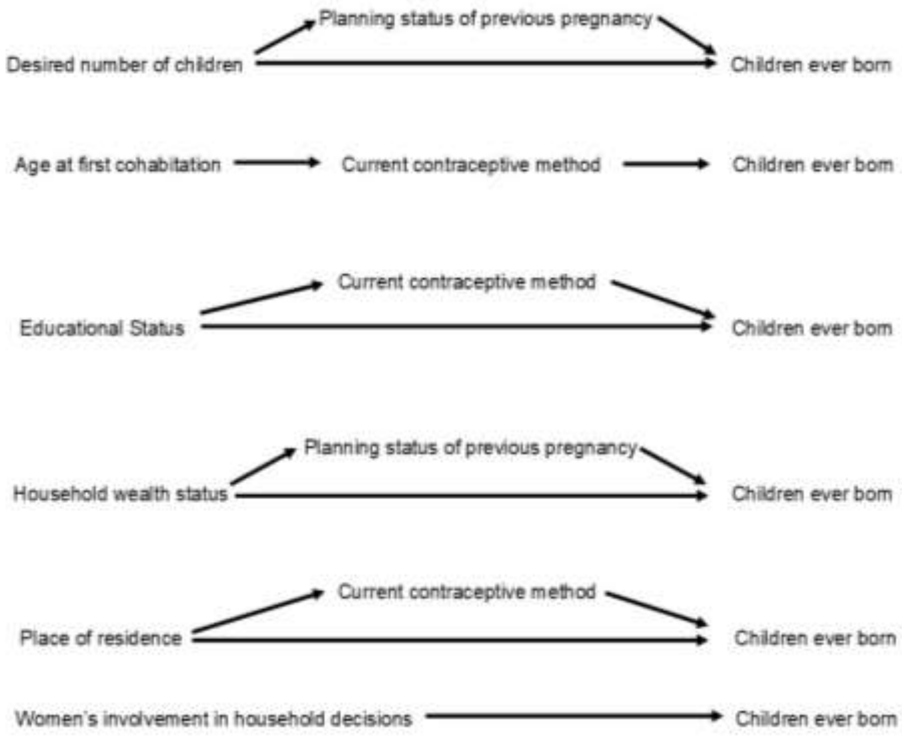
The results of the pathway models show the direct and indirect ways in which the socio-demographic factors affect the reproductive health outcomes to influence children ever born. Models 2 and 3 include less and more severe physical GBV, respectively, and show how the inclusion of physical GBV moderates the influence of the exogenous (socio-demographic) and endogenous (reproductive health outcomes) factors which additively increase children ever born in Uganda. Perhaps the most beneficial aspect of pathway analysis, in comparison to using Poisson and Multi-Level Poisson models, is that one can see and measure the effect of the direct and indirect pathways that lead to increased fertility levels, something which the previously mentioned methodologies are not able to do.

First and foremost, one can see that the reproductive health outcomes as well as each severity of physical GBV have significant effects on children ever born – in total, but also directly and indirectly. Furthermore, the path models show that the total effects of physical GBV is not only moderated by the effect of experience of GBV on the reproductive health outcomes but is affected by the influence of the endogenous factors as well but further directly affects children ever born suggesting the cumulative important of physical GBV in explaining variations in fertility in the country. In fact, the models which included both less and more severe physical GBV were shown to be models of better fit than the first model which did not include GBV. However, as with the multi-level results in the previous chapter, the pathway models show that irrespective of the level of severity of physical abuse that the women endure – the direct, indirect and total effects of abuse are significant and similar in their effect of children ever born.

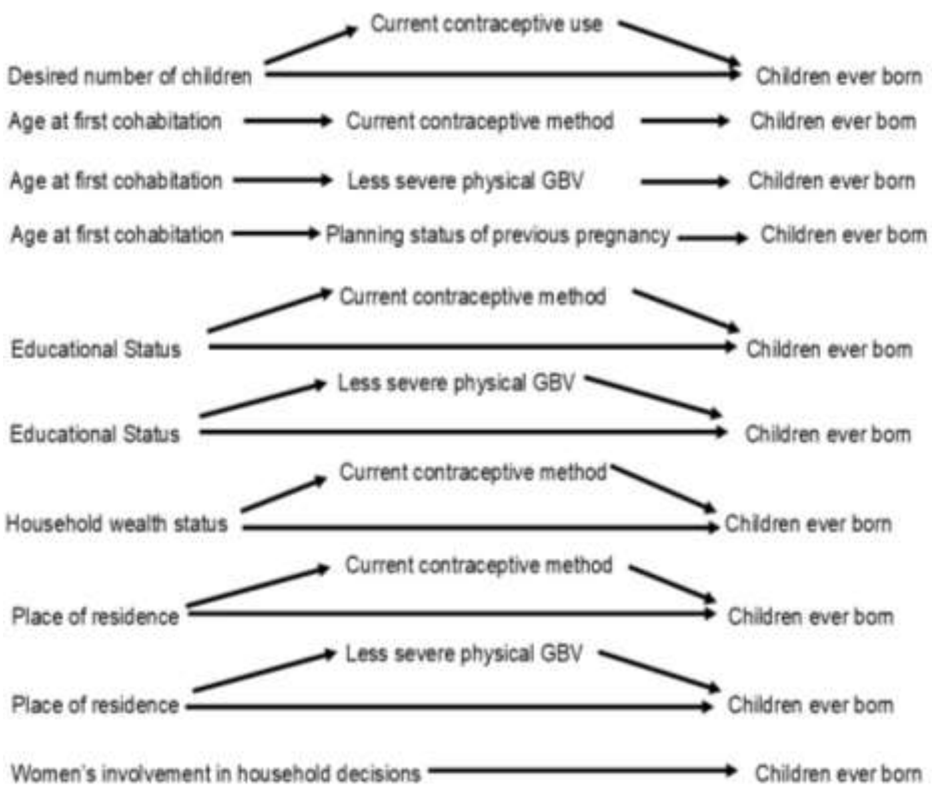
Furthermore, the effect that abuse has on the reproductive health outcomes – which we know from the results but also from literature are core indicators of whether fertility in a country will increase or decrease – are amplified by the moderating effect of physical GBV. Also, individual level factors that are known to depress fertility levels in a country, such as educational level and household wealth status, are negatively impacted by experience of physical GBV. As such, at least some of the gains that one would see in fertility due to an increase in female education, wealth and female autonomy could be circumvented by the experience of physical GBV by these women.

Although all factors, except employment status, were significant in total – some key factors were the largest contributors to children ever born in Uganda. In order of importance, these were educational status, planning status of previous pregnancy (one of the RH outcomes), place of residence, ever having had a pregnancy terminated, following by women's involvement in household decisions and women's experience of less severe physical GBV. Age at first cohabitation and asymmetry of desired number of children, though no less important, were the least largest contributors on the effect on children ever born.

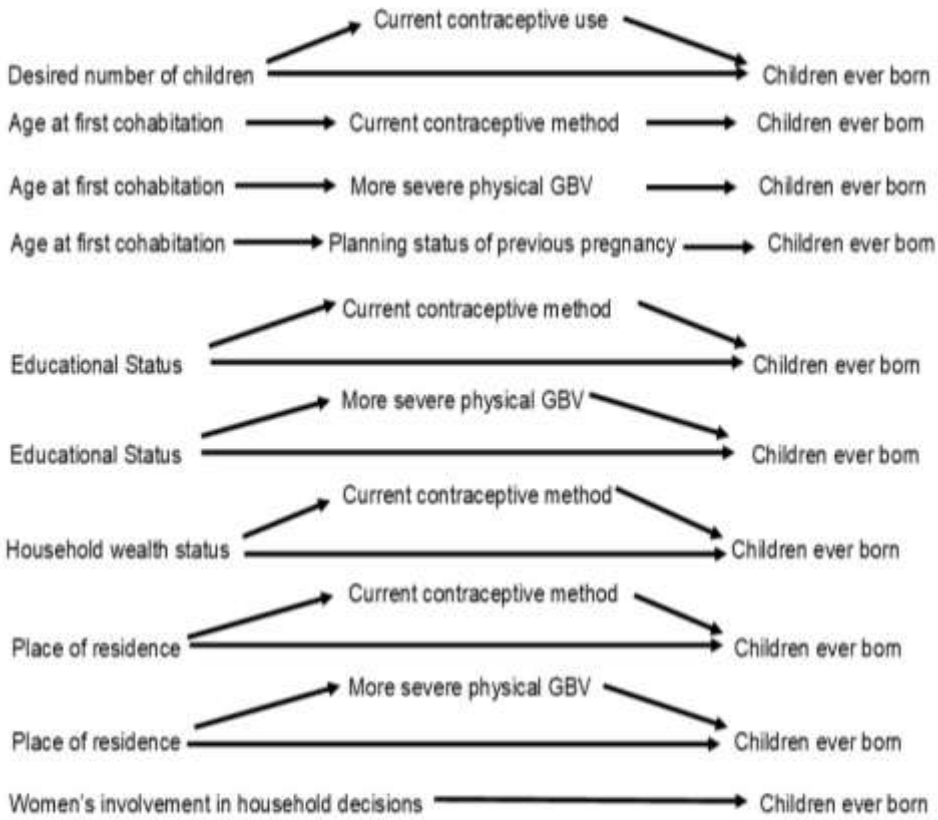
Therefore, the significant pathways in this recursive model of fertility, in which no GBV is included are:



Whereas, the significant pathways in this recursive model of fertility, in which no GBV is included are:



Finally, the significant pathways in this recursive model of fertility, in which more severe GBV is included are:



CHAPTER EIGHT

DISCUSSION

8.1 Introduction

This chapter provides a comprehensive discussion of the research hypotheses, followed by a discussion on the results of the previous sections. Specifically, results in chapters 4 to 7 are discussed, and their relevance and pertinence to the research objectives are outlined under the first sub-section. The discussion section is then followed by the strengths and limitations of this study.

8.2 Discussion of Research Hypotheses

<u>Hypothesis One</u>

Higher levels of physical GBV are associated with a higher number of children ever born through higher levels of unplanned pregnancies and levels of having had a pregnancy terminated; but lower levels of contraceptive use (RH Outcomes).

H_0: Levels of physical GBV are not associated with children ever born, through the RH outcomes

H_1: Higher levels of physical GBV are associated with higher number of children ever born, through the RH outcomes

This hypothesis is based on the premise that if women have experienced physical GBV they will experience lower levels of contraceptive use either because they are not able to access them due to restrictions on movement or due to injuries sustained through abuse. Alternatively, women may forget to take their contraception due to the psychological trauma associated with the experience of the abuse. As such, women who are in these situations may experience a higher number of unwanted or mistimed pregnancies. On the other hand, women who experience physical abuse may experience miscarriages or stillbirths due to injuries sustained or may opt for an abortion due to mistimed or unwanted pregnancies. While non- or inconsistent contraceptive use and mistimed or unwanted pregnancies may increase the number of children ever born, the loss of a child in-utero or the use of abortion may depress the number of children ever born but insufficiently that overall fertility will be higher amongst women who experience physical GBV.

Although the results of the study did show that the experience of physical GBV increases the number of children ever born, the ways in which physical GBV acts upon children ever born was not in the pathway originally hypothesised. Firstly, the association between physical GBV and children ever born was tested using unadjusted and adjusted Poisson regression, followed by multi-level Poisson models, and the use of Pathway Analysis. All the analyses used did in fact show significant associations between physical GBV and children ever born with a p-value set at the 95% significance level ($\alpha = 0.05$). In all instances, less and more severe physical GBV was associated with at least a 9% increase in the number of children ever born (adjusted and multi-level models) and up to 25% increase in the unadjusted models, irrespective of the severity of the physical GBV experienced. However, unlike what has been found in the literature, while ever having had a pregnancy terminated was found to increase children ever born, the current use of contraception was found to increase the number of children ever born amongst those on traditional methods. Women on modern methods were not found to have an association with children ever born in most instances. In line with literature and the current hypothesis, women who had not planned their previous pregnancy were found to have a higher number of children ever born.

Furthermore, the pathway analysis allowed for an investigation of how the pathways between physical GBV and the RH outcomes influence children ever born. As such, less severe physical GBV significantly and positively influences current contraceptive methods and ever having had a pregnancy terminated, but negatively influenced planning status of previous pregnancy. In other words, while ever having experienced less severe physical GBV increased the probability of currently being on contraceptives and ever having experienced a termination of pregnancy, it decreased the probability that the previous pregnancy was planned. Furthermore, current use of contraception and ever having had a pregnancy terminated increased the probability of having a higher number of children, whilst those women who planned their previous pregnancy had a lower number of children ever born. Although the relationships did not work in the originally hypothesised trajectory, less severe physical GBV is in fact associated with higher number of children, through its influence on contraceptive use, whether the pregnancy was planned and ever having had a pregnancy terminated. On the other hand, the total effect of more severe physical GBV on ever having had a pregnancy terminated was not significant. Therefore, at least in part, the null hypothesis is rejected.

Hypothesis Two

More educated women have a lower prevalence of physical GBV and therefore a higher use of contraceptive use, and therefore a lower number of children ever born.

H_0: Education has no association with physical GBV, contraceptive use and children ever born.

H_1: Education is associated with physical GBV, contraceptive use and children ever born.

The second hypothesis is based on the premise that women with a higher level of education have a higher level of knowledge, seek knowledge regarding their health and choices regarding contraception, and have a desire to limit the number of children ever born both due to a desire to concentrate on their careers and because of less time for child-rearing. Furthermore, the literature reviewed shows that women with more education are often more empowered, and as such women of a higher educational status would be empowered to implement preventive measures or leave a relationship which is abusive. Given that women who do not experience physical GBV also show higher use of contraception, this would also lead to a decrease in the number of children ever born.

Results from this study do show that women of higher educational status significantly experience less physical GBV and have lower children ever born. These results were consistent in the unadjusted, adjusted, multi-level and pathway analysis. In fact, educational status was seen to be one of the most important explanatory factors for both physical GBV (irrespective of severity) as well as children ever born. With each subsequent increase in educational level, children ever born decreased by at least 20%. This result was consistent in the unadjusted, adjusted and multi-level models. Furthermore, the unadjusted regression for each of the severities of GBV also showed that as educational level increases the odds of the woman experiencing less severe physical GBV decreases as well, again by at least 20%. For both children ever born and less severe physical GBV, however, the positive effect of education was seen most drastically for women with at least a completed secondary education or higher. Furthermore, the relationship between education on current contraceptive use also consistently showed, according to the pathway analysis, a significant positive effect. In other words, as educational level increased so did the current use of either traditional or modern forms of contraception. Therefore, the null hypothesis for hypothesis two is rejected.

Hypothesis Three

Prevalence of physical GBV increases with younger age at first cohabitation due to a lower level of women's empowerment (household decision-making used as a proxy for women's empowerment).

H_0: Age at first cohabitation is not associated with physical GBV and women's empowerment.

H_1: Age at first cohabitation is associated with physical GBV and women's empowerment.

Given the higher number of women who first cohabitate at ages below 20 years, and many of whom are even as young as 15 years or below, the premise of this hypothesis is that women who have entered unions at such low ages are not able to complete their education which could lead to higher levels of empowerment. Furthermore, women who enter unions at young ages are also in the legal sense still children and adolescents, and as such may feel as though they do not have the right to say no to abuse from the partner and / or to take decisions regarding both their and their household members interest, whether regarding health or economic decisions. Furthermore, women who enter unions with having completed their education are less likely to have sustainable and gainful employment, and therefore the resources and support to leave abusive relationships in the long-run.

Women who first cohabitate at young ages have higher levels of less and more severe physical GBV. However, household decision-making was not found to be associated with physical GBV according to the unadjusted and adjusted results of the regression models for physical GBV. Therefore, although age at first cohabitation is associated with higher levels of experience of physical GBV, the hypothesis that it is through a decreased level of women empowerment or decision-making autonomy could not be found. Therefore, only part of the null hypothesis could be rejected.

Hypothesis Four

Women living in rural areas have a higher prevalence of physical GBV, and therefore lower levels of contraceptive use leading to higher number of children ever born.

H_0: Place of residence is not associated with experience of physical GBV, contraceptive use and children ever born.

H_1: Place of residence is not associated with experience of physical GBV, contraceptive use and children ever born.

Literature from elsewhere has shown that women living in rural areas have lower access to contraceptive use and a higher number of children. Furthermore, some literature has found that women in rural areas also experience GBV more often than those in urban areas. Given that the experience of physical GBV itself has also been shown to decrease the use of consistency of use of contraceptives as well as increase the number of children ever born, the experience of physical GBV amongst rural women could be an alternative explanation for lower levels of contraceptive use and higher number of children in these areas.

Firstly, results show that women living in rural areas have significantly higher number of children ever born. The results of the unadjusted odds ratios between each severity of GBV and place of residence also show that women living in rural areas experience physical GBV more than those in urban areas. Also, the results of the pathway analysis showed that place of residence was a significant explanatory factor in current use of contraceptives – having a negative influence on current use of contraception. The pathway from place of residence to each severity of physical GBV as well as on current use of contraception to children ever born was one of the most important in terms of the magnitude of effect. As such, the null hypothesis for hypothesis four is rejected.

Hypothesis Five

Women living in communities with high levels of women with secondary or higher education have lower prevalence of physical GBV, higher contraceptive use and therefore lower number of children ever born.

H_0: Community level of education has no association with physical GBV, contraceptive use and children ever born.

H_1: Community level of education is associated with physical GBV, contraceptive use and children ever born.

Previous literature has shown that in some places it is not only individual level educational status that influences whether a woman experienced physical GBV and whether they access or consistently use contraception. In some instances, because of simply being around other women who have access to such information and social behaviours can in fact have a society wide effect on women within those communities who have lower levels of education. This would be important in a country such as Uganda where educational level of women is low.

The unadjusted results showed that women who live in communities where there is a high percentage of women with secondary or higher levels of education have both lower experience of physical GBV and lower children ever born. However, in the adjusted and multi-level results community level of female education was no longer a significant explanatory factor for children ever born. Therefore, for hypothesis five the null hypothesis cannot be rejected.

Hypothesis Six

A higher prevalence of physical GBV leads to a higher number of children ever born, both directly and indirectly.

H_0: Experience of physical GBV is not associated with children ever born either directly or indirectly.

H_1: Experience of physical GBV is associated with children ever born directly and indirectly.

This hypothesis is based on the idea that physical GBV acts on children ever born directly. This could be due to differences in desire for children between the husband and wife, abuse may be used as a way to coerce the women to either have or stop having children. Furthermore, physical GBV may act on children ever born indirectly through its influence by the socio-demographic proximate factors and its influence on the RH intermediate factors.

The results of the pathway analysis show that physical GBV is in fact both directly and indirectly significantly associated with children ever born, and as such was one of the most important factors to influence children ever born in the pathway models. However, the coefficient of more severe physical GBV was higher than that of less severe physical GBV, in total. Furthermore, for both less and more severe physical GBV the direct effect was far larger than the indirect effect – but cumulatively less severe GBV had a coefficient of 0.46 and more severe physical GBV had a coefficient of 0.60. Therefore, the null hypothesis for hypothesis six is rejected.

8.3 *Discussion of Research Findings*

8.3.1 Discussion of the Levels and Trends and Differentials of Fertility of Ugandan Women

The reported TFRs show that over the period of 1989 to 2011, fertility levels remained high through they decreased by around 1 child per women 7.386 in 1989 to 6.200 in 2011. This in fact repudiates with the findings from Ezeh, Mberu and Emina (2009) who in a study which used DHS data from 4 East African countries, including Uganda, found that fertility in the country had remained in the “pre-transition” phase in the preceding 20 years, showing the Uganda has begun a transition – albeit slower than desired.

In comparison to the reported TFRs, the TFR values derived from indirect estimation techniques (Brass P/F Ratio and Relational Gompertz Methods), show only slight variations in the fertility levels throughout the period. However, variations in the differences between the directly reported values and the indirectly estimated values varied according to the years. In 1989, the TFR (direct) value was 7.836 compared to 7.398 (Brass P/F) and 7.318 (Relational Gompertz). Comparatively, however, the same values in 2011 showed that both indirect measures estimated higher TFRs than the directly estimated values. However, this is not contrary to what other studies that have compared direct and indirect fertility measures have found, specifically with regards to the use of DHS data. Madari (2014) analysed fertility in Zimbabwe using both direct and indirect measures and showed similar variations in the results of the indirect estimated values of TFR and the actual reported TFR. Differences are mainly due to reporting errors, given that the questions regarding children ever born are asked retrospectively. Retrospective data is often mired by recall bias, specifically in cases where children have either died very early after birth or many years before the survey was conducted (Hassan, 2006). Furthermore, Cleland and colleagues (1994) also conducted a multi-country study, which included Uganda, and assessed data quality and decreases in fertility with both reported data as well as the P/F Brass method. Their conclusion until this point, however, was that both the reported and the implied TFRs showed no signs of fertility decrease in Uganda, but in fact showed a stall in fertility. However, in this study the differences in the results are so marginal, that even with errors in reporting, the data used provides an accurate depiction of the slight decrease in fertility in Uganda over the past 20 years.

Results from the P/F Ratio method concur with the analysis of the reported values – remembering that a P/F Ratio of 1 would suggest that fertility had remained constant over time; whilst if P/F Ratios increase with age, one would expect the fertility to be decreasing. This latter pattern was seen in the P/F ratios in 1989 to 2006, whereby the P/F ratios increased from the early to the older ages, but the opposite was seen in 2011 – in which P/F ratios increased from 1989 to 2000, remained somewhat like ages 35-39, increased slightly at age 40-44 but decreased again to a value just higher than the 15-19-year-old P/F ratio in ages 45-49. Furthermore, although in all years the P/F ratio increased to slightly over 1 in older ages. This could indicate that in your age groups in previous years, births by women were underreported. Therefore, something shifted amongst women in older ages during the period in which the previous trend was that there was a slight overreporting of previous births.

Furthermore, the reported measures (mean CEB, mean achieved fertility rates and reported TFRs) show that even though these rates decreased slightly overall throughout the period (around 1 child per women according to the TFR). One, however, would assume that during this period, with gains in education and women's empowerment, that fertility at lower ages would have decreased more dramatically, with a sharper increase in the middle of women's reproductive ages – from 1989 to 2011 comparatively. In countries where fertility rates have decreased, these have been two of the major explanatory factors identified leading to a decrease in fertility in those contexts (Jejeebhoy, 1995; Upadhyay et al., 2014).

While levels and trends were assessed using both the direct and indirect fertility methods, fertility differentials were assessed using the three direct fertility measures mentioned above. As at 2011, Ugandan women had a mean CEB of 3.52, a mean achieved fertility of 6.93, and a reported TFR of 6.20. High, even for sub-Saharan standards this has some of the highest fertility levels in the world, but on par with what has been found in other studies on fertility in Uganda (Shapiro & Gebreselassie, 2009). There are in fact several reasons that this study, as well as others, have shown for these persistently high levels of fertility.

This study shows that women of reproductive age in Uganda have a high prevalence of GBV as well. Over 41% of women had experienced emotional or less severe physical GBV, whilst 1 in 5 women ever experienced both less and more severe physical GBV in their lifetime. The average number of children was 21% higher for women who had experienced less severe GBV and 25% higher for women who had experienced more severe GBV, compared to those that had not. This concurs with global estimates and studies which has shown high prevalence of abuse within relationships in Uganda (WHO, 2013). In the unadjusted regression models, this relationship between children ever born and ever experience of GBV was shown to be significant. These results show that GBV may be used to coerce women to have more children, if they do not want to; or as punishment if they cannot have more children – otherwise known as reproductive coercion (Miller, McCaw, Humphreys & Mitchell, 2015).

The fact that CEB and both severities of physical GBV show a significant association, may show that women have more children to please their partners and / or in the hope that violence within the relationship will cease once the children are born (Miller, McCaw, Humphreys & Mitchell, 2015). What is even more concerning being that even when the above results were compared between women who had and had not experienced less and more severe physical GBV – those that had experienced either type of physical GBV, albeit of different magnitude, consistently had higher fertility levels than women who had not. Therefore, at the bivariate level, there is an association between less and more severe physical GBV and fertility levels in Uganda confirming the work of Odimegwu and colleagues (2015).

One precarious finding was that women on no methods of contraception had lower fertility than women on modern and traditional forms of methods. This is strange given that the literature and theoretical framework show women that are on contraception should have lower fertility levels than those who are not – especially modern methods (Sedgh, Ashoford & Hussain, 2016). However, in the case that women are using contraceptive methods to cease child-bearing either at older ages or once a higher number of children have been born, rather than to delay or space births earlier on in their reproductive life cycles, this might show up in a cross-sectional dataset in which temporality cannot be shown as the fertility rates are shown to be higher amongst women who are currently on contraception. This was seen in a study conducted in Ethiopia, where by the odds of using contraceptives increased with each subsequent number of children born to women (Lakew, Reda, Tamene, Benedict & Deribe, 2013). This is especially the case for women who have already given birth.

Linked, and giving credence, to this argument is the fact that those women who stated that they had planned their previous pregnancy also had lower fertility. These women, who are planning their births, may be using modern and traditional contraceptive methods to time their births accordingly. However, in a pronatalist society – such as in Uganda – this may not necessarily be to limit the number of births in total, but simply to spread them out (Creanga, Gillespie, Karklins & Tsui, 2011). Furthermore, given that childbearing in Uganda begins at very young ages, this also provides emphasis to the argument that contraception, when used, seems to be used to delay subsequent births or to cease child-bearing once children are born. However, it does not seem to be used as a preventive measure at younger ages. Providing contraception to girls who are beginning their reproductive life-cycle could delay child-bearing, and influence fertility levels in the long-run if used consistently (Raj, Saggurti, Balaiah & Silverman, 2009). However, this will not happen if early marriage and high fertility, together with high prevalence of violence within the marriage or union continues - even if policies and programmes encourage limiting the number of children ever born.

Furthermore, contrary to what was originally hypothesised, women who had experienced a termination of pregnancy (stillbirth, miscarriage or abortion) had drastically higher fertility than women who had never experienced a termination of pregnancy. Over 1 in 5 women stated that they had ever had a pregnancy terminated – although it is not known from the data whether this meant a stillbirth, miscarriage or a choice abortion. However, this may indicate that a large percentage of women, whom do not have access to family planning methods, could be using pregnancy termination as a way in which to control their fertility (Gorrette, Nabukera & Salihu, 2005). This, however, is worrisome – given that abortion in Uganda is illegal, and therefore such abortions are not done in safe medical environments; and could lead to severe reproductive health problems immediately or later in life (Gorrette, Nabukera & Salihu, 2005).

However, whilst there is a limitation in this variable in that due to the illegality of abortion in Uganda, one cannot assess whether termination of pregnancy is any of the 3, it does provide some important insight. It does seem unlikely that abortion may be being used as a fertility prevention method by many women in Uganda. It seems more likely that a large proportion of these women have experienced a stillbirth or miscarriage (or alternatively had an abortion due to defects of the baby – either developmentally or due, for instance, from an accident or bout of abuse). If this is the case, this result may be more in line with the discussion in the literature that has found that women who have experienced the death of children have higher fertility rates than those who have not – some authors think due to the idea of replacement, and the fear of losing subsequent children (Kirk & Pillet, 1998; Adedini, 2014)

According to ethnicity, previous studies have shown that ethnicity may in fact play a role in fertility rates amongst women of certain ethnic groups. This has certainly been the case in Nigeria, whereby some ethnic groups are found to be significantly more or less pronatalist than others. This could be due to a host of reasons, not precluding dominant religious affiliations but also cultural norms regarding fertility and family size (Avong, 2001). Alternatively, variations in fertility between ethnic groups could also reflect variations in contraceptive access, education and the place of residence of the region in which certain ethnic groups live (Takyi & Addai, 2002) However, the analyses conducted in chapter 5 showed that although Muganda women consistently had the lowest fertility levels across all three measures, but Munyankole, Mukiga and Musoga women had amongst the highest in all three fertility measures. However, as discussed below – once all factors were controlled for, ethnicity no longer explained variations in fertility levels amongst Ugandan women.

As already mentioned, previous work has identified a high value placed on children amongst women, men and kinship structure in Uganda. Although shown to be at a lesser or higher extent amongst certain ethnic groups, the variations are not significant enough to show that ethnicity in Uganda is associated with fertility differentials in the country. This concurs with the findings of Finocchario-Kessler et al. (2014) who found that the high value placed on children and large families is widespread in Uganda. As such, there are other factors that better explain the fertility differentials and variations in the country.

The fertility differences by educational status showed unsurprising results, as educational level increased the fertility levels amongst these women decreased quite drastically. This pattern is known and evident, not only in Uganda, but throughout the world (Shapiro & Gebreselassie, 2009; Bbaale & Mpuga, 2011). However, women who have completed at least secondary schooling in Uganda is extremely low as seen by the results of this study, and therefore may be one of the reasons that Uganda continues to retain such high fertility levels. The lowest percentage of women (5%) had a higher than secondary level of schooling, whilst just under two thirds only had a primary level of schooling and around 14% had no schooling whatsoever.

Similarly, results of the unadjusted regression model showed that those with at least a primary school level of completed education had 35% less children than those with no schooling, whilst the corresponding results for secondary and post-secondary were 64% and 72% less children compared to women with no schooling, respectively. Given that the results of this study, as with other studies, show that higher levels of education decrease both the incidence of GBV (Abramsky et al., 2011) as well as decrease fertility levels in the country (Testa, 2014), it is imperative that efforts be increased to ensure that women complete at least a secondary level of schooling, and higher percentages of women have a higher than secondary qualification.

Under objective 1, employment status showed a strange pattern in Uganda – unlike what has been found in other countries and regions whereby women who are employed have a lower number of children (Hilgeman & Butts, 2009; Beguy, 2009) – at least at the bivariate level this is only partially shown. In Uganda employed women had higher mean CEB and TFR, although lower achieved fertility. This could be partially explained by a finding that has been identified in some studies. Such studies have found that the type of employment women is in may play a part in their fertility levels – women in salaried employment have less additional births than those who are self-employed (Beguy, 2009). Therefore, the type of employment may be more of a factor than whether the woman states that they are employed or not. In fact, a simple cross-tabulation of employment by employment type using the 2011 DHS data shows that the major types of employment that women are in in Uganda are in fact self-employment, informal and agriculturally based. These types of employment are not in line with the hypothesis that women who are employed have less time for children and may not want a higher number of children as they would like to concentrate on their careers. A study conducted in Ghana did in fact find that informal and self-employed women had higher odds of starting early parenthood than those who were permanent and salaried employees (Takyi & Addai, 2002).

Furthermore, this may have a direct link to the type of education many of the Ugandan women have – which, as already discussed, is exceptionally low. Thus, increasing educational level amongst women would also change the types of employment they enter – from low-skilled and precarious employment (often which is informal and self-employed) to higher skilled, professional and technically-based professions and overall upward social mobility (Brown, 2013). Furthermore, in terms of women's empowerment, holding such positions provide women with the power or empowerment to be able to decide and reach, either solely or in part, their desired fertility preferences (Upadhyay et al., 2014; Bradley, 1995). This would increase negotiating power for household-decisions and being able to negotiate and afford contraception.

Linked very much to the education and employment nexus, is the issue of age at first cohabitation. The descriptive statistics in this study show that Ugandan women first cohabitate at very early ages (below the age of 20 years, but very often even below the age of 15), which has been found in other studies as well (Walker, 2012). The younger the age at first cohabitation, the higher the fertility rate of the woman (Ayiga & Rampagane, 2013) - this was also evident amongst all three fertility rates in this study – the mean CEB, mean achieved fertility, and reported TFR). It is known that there is also a biological reason for this, given that the longer the time of exposure to sexual intercourse the higher the likelihood that a woman will fall pregnant. This is simply since these women would spend more of their reproductive life (from menarche to menopause) in sexual relations, thus increasing the risk of pregnancy over a longer period. Furthermore, the younger a woman cohabitates the lower the likelihood that she will complete her education and the higher the likelihood that they will be poor (Dahl, 2010) and that employment held by such women will be informal, precarious and / or agriculturally based (Walker, 2012) – all of which are seen to contribute to higher fertility rates as well. Young age at first cohabitation therefore opens multiple pathways in which fertility rates could be pushed up, as is the case in Uganda.

One precarious finding was that women in Uganda that stated that they were either partly or solely involved in key household decisions had higher mean CEB, mean achieved fertility, and reported TFRs than those that were not involved in these decisions at all. This is contrary to the ongoing debate regarding women's empowerment and how this leads to a decrease in fertility (Upadhyay et al., 2014). However, in the Ugandan context, as mentioned above, there is major value placed on having children and on women – given that this is seen as their duty mainly as an outcome of peer and social pressures (Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). Therefore, given the option, it is probable that most women would elect to have more, rather than less children simply as a social norm. The variable for women's empowerment, women's decision-making autonomy, did not show conclusive results in this study. However, Upadhyay et al. (2014) did a systematic review of over 60 countries, specifically on the issue of women's empowerment and fertility. In most cases, women's empowerment was positively related to decreases in fertility – specifically the measure of household decision making Therefore, the results of this study do not conform with what was found by these authors. As such, it may be that further investigation into women's empowerment and measures therefore, be included in subsequent studies on fertility in Uganda as it is also known that women (and men) in Uganda generally favour larger families and a higher number of children (Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). This could also circumvent any gains in education or women’s empowerment; if social pressure to have large families and more children persist.

The fertility differentials by household wealth status conform with what has been found in the literature, in that the higher the level of wealth the lower the fertility (Dahl, 2010). This, however, could reflect several different scenarios that could be occurring – firstly educated women and men earn more, secondly wealthier households tend to live in urban areas both of which have shown to depress fertility levels elsewhere (Young, 2012), but also in the present study.

On the other hand, asymmetry of desired number of children showed surprising results – although not much literature exists on the topic, the few literatures find that this varies across time and space. In other words, depending on the context, number of children that have been born until that point, as well as sex preference of the man and woman – fertility desires may be similar or disparate between partners (Mason & Taj, 1987). In Uganda, while woman whose husbands wanted more children than they did had the highest mean CEB, women whose husbands wanted less children had the highest mean achieved fertility and women whose husbands wanted the same number of children as they did have the highest reported TFR. Again, this could very well be because of the value placed on children and on women bearing children in Uganda (Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). The pressure on women to bear children may come from society, family and husbands and therefore there may be more of social and kinship pressure for some families, whilst the others may be from the husbands themselves (Miller, McCaw, Humphreys & Mitchell, 2015).

Regions faired differently in terms of their fertility variations, the one distinct pattern that emerges is closely related to the place of residence. For all fertility measures, Kampala had the lowest fertility – which is also the most urban area in Uganda (urban fertility was consistently lower than rural fertility). This is not different to what has been found all over the world, and not specifically just in Uganda (Kulu, 2013) As with education, it is well known that those living in urban areas experience lower fertility rates – for several reasons but the most pertinent being that children living in urban areas are more expensive, often people in urban areas have some form of employment which may not allow for child-rearing, and urban areas generally have better access to family planning services and methods (White et al., 1998).

Community level of female education showed the same pattern as individual-level educational status. Communities that had high percentage of women with secondary or higher education had the lowest fertility. This has been found in previous studies as well (Kravdal, 2002) and renders the possibility of pathways in which education depresses fertility far broader than simply at the individual level. Whilst individual level education is important, as a society or community educates their female population there is a diffusion effect – in that even those women who do not have the same level of education may learn ideas from more educated women that they would not have otherwise known living in a society or community that has a low level of female education (UN, 1990). The same can be said regarding community level of wealth, given that the same differentials were seen – those women living in communities with a high percentage of households classified as richer or richest had the lowest fertility levels amongst all three of the direct measures. This is similar to the results found by Kravdal (2002), albeit with a different measure of community wealth. In Kravdal's study community wealth was found to be an important explanatory factor of fertility. Once it was included in the model, the benefits of community level education decreased suggesting it to be an important factor to include when investigating fertility rates in developing countries.

One finding that was hypothesised, but for which literature is almost non-existent, is that women living in communities whereby percentages of women experiencing low and/ or more severe physical GBV was high also had the highest fertility levels. The argument could be made along the lines of the social disorganization theory which states that low socio-economic status and general community disruptions lead to community disorganisation (which includes increases in crime and violence) (Sampson & Groves, 1989). It could, therefore, be that even when the woman herself does not experience either severity of physical GBV, simply being in a community where GBV rates are high could lead to an increase in fertility levels.

8.3.2 Discussion of the Individual and Social Context of Fertility with Physical GBV in Uganda

Adjusted regression models and multilevel models were used to investigate the effects of GBV, as well as the individual, household and contextual determinants, on fertility in Uganda. The first adjusted regression did not include any severity of physical GBV, to compare the adjusted results in the models which included less and more severe physical GBV in turn. All factors showed a significant association with children ever born in the unadjusted models (Appendix C). There were several factors that were no longer significant once all factors were adjusted for. This was, in part, used to select the factors that were included in the final path way analysis in Chapter 7. The factors that remained significant in the adjusted models, compared to the unadjusted models, were the three RH outcomes (although not for modern contraception), educational status, employment status, age at first cohabitation (although not for those that first cohabitated at age 25 years or older), women's involvement in household decisions, asymmetry of desired number of children, place of residence, and then a few categories in region of residence as well as both household wealth status and community level of wealth.

In the Poisson multi-level models' RH outcomes were significant predictors of children ever born once adjusting for both less and more severe physical GBV, but the current use of modern contraceptives was not always significant – specifically when the household level factors were included in each of the models (A2 and A4, B2 and B4, and C2 and C4). Furthermore, key factors of interest (ones that consistently remained significant despite the model) included, over and above the two severities of physical GBV and the RH outcomes, were educational status of the women, employment status, age at first cohabitation, wealth status (specifically those in households classified as richer and richest), asymmetry of desired number of children, place of residence, community level of female education and involvement of households decisions by the woman.

In the adjusted models that included the two severities of physical GBV in turn, both less and more severe physical GBV had a significant relationship with children ever born. This confirmed the results of the unadjusted results in this study and the results from Odimegwu and colleagues' study (2015). Women who experienced less or more severe physical GBV had 9% more children ever born than those that did not.

The study by Odimegwu and colleagues (2015) showed that women who experience physical GBV in two out of the three countries investigated, results from their Poisson regression showed that higher fertility was associated with ever experience of GBV – even after controlling for other socio-demographic factors. However, less severe physical GBV increased to 10% and 11% more children ever born amongst those women who experienced this form of GBV when only household and community level factors where controlled for in the multi-level models but remained at 9% in the model which only controlled for individual level factors, as well as the full model.

Furthermore, in comparison to the multi-level models that included less severe physical GBV (Models B), women who experienced more severe physical GBV (Models C) had 11% more children ever born than those that did not experience more severe physical GBV when individual level factors only were controlled for and in the full model. In the models that controlled for only household factors and community factors, this increased to 13% and 15% more children ever born, respectively - a considerable increase from those who experience less severe physical GBV.

Comparison of less and more severe physical GBV did not change the significance of any of the proximate or intermediate factors, although it did alter the magnitude of the IRRs for several factors and categories. Odimegwu and colleagues (2015) did not look at the differences between less and more severe physical GBV but instead looked at physical GBV which included all types and severities of physical abuse in one variable. However, Campbell (2002) writes that victims respond differentially according to the type of trauma and injury they endure. This has also been found in terms of the different severities of physical GBV in relation to the way in which it affects RH outcomes and fertility. The results of the adjusted and multi-level models it shows that it is important to look at less and more severe physical GBV differently – given that the magnitude of effect is different between the two. While the adjusted and multi-level results only show marginal differences between the two severities on fertility itself- discussions in the next section of the chapter confirm that there are differences in the pathways and total effect on children ever born amongst those who experience less and more severe physical GBV. Confirming that investigating both less and more severe GBV's effect on fertility in Uganda is notable and an important consideration, rather than treating all severities of physical GBV as having equal effect and magnitude.

In the adjusted models, women currently on traditional contraceptive methods had between 26% (model where no GBV was included) and 27% (models with both less and more severe physical GBV included) more children than women on no contraceptive method. However, women currently on modern methods of contraception were not a significant factor with children ever born in either of the adjusted models. These figures, however, decreased considerably in the multi-level models. In the A models (no GBV included) women on traditional methods of contraception had between 21% and 23% more children than women who were not currently using any forms of contraception, but 26% more children in the full model. Furthermore, when only individual level factors and RH outcomes were included and when only community-level factors and RH outcomes were included in the models, women on modern forms of contraception had 8% and 9% more children than women on no contraceptive method, respectively. The introduction of less and more severe physical GBV in models B and C only showed marginal changes in the Incidence Risk Ratios for fertility.

In fact, the introduction of less and more severe GBV into the multi-level models only altered current use of contraception, as well as planning status of previous pregnancy, by 1 percentage point difference in the models here changes were seen. The most notable change amongst the RH outcomes was amongst ever having had a pregnancy terminated. Specifically, woman who had ever experienced a termination of pregnancy had 24% more children than those that did not – this decreased to 17% in both the models with less and more severe physical GBV. This, however, is in line with what has been found in the literature – GBV has pervasive effects on RH outcomes amongst women, specifically unintended pregnancy, contraceptive use, and abortions and miscarriages (Gazmararian et al., 2000; Heise, Ellsberg & Gottmoeller, 2002; Pallitto & O'Campo, 2004; Nalwadda, Mirembe, Byamugisha & Faxelid, 2010).

Education continued to show a protective effect on higher fertility in that in all three adjusted models, and all three multi-level models, each increased educational level showed a significant decline in children ever born. The introduction of each severity of physical GBV did not alter the results of education on fertility in either the adjusted models or the multi-level models. Given that women of higher educational status were also seen to experience each severity of physical GBV than women who had lower education (in the unadjusted odds ratios for GBV), education may in fact be one of the most important factors that could decrease fertility. This has been found in other studies; however, the way in which education could also depress experience of physical GBV therefore provides a dual protective effect for women. This is specifically important in Uganda, where fertility is high, experience of physical GBV is high, and educational levels are low as we have seen from previous discussions.

As mentioned earlier, one of the key reasons that women in Uganda may not be completing their education is specifically because a high proportion are entering first cohabitation at exorbitantly young ages – and specifically before the ages in which a least a secondary education may be obtained. This was specifically found by Ayiga and colleagues (2013) who looked at the differences between Uganda and South Africa to assess the determinants of early age at first cohabitation. These authors state that the fertility differences and the differences in the age at first cohabitation between the two countries can be understood through the differences in education (and women's empowerment) amongst South African and Ugandan women. However, although increasing age at first cohabitation and ensuring that women complete their education is key. Simply placing measures that will limit the possibilities of women entering first cohabitation at young ages will not lower fertility levels on its own. This is seen by the fact that although each subsequent increase in the age at first cohabitation decreases children ever born compared to those who first cohabitated at below age 15 – the decrease was lower amongst those who first cohabitated between ages 20-24 compared to 15-19. Furthermore, it should be noted that the decrease in fertility was far less once less and more severe physical GBV was introduced into the models – both the adjusted and multi-level models. Therefore, experiencing physical GBV – whether less or more severe – could circumvent at least some of the benefits related to entering a union at older ages.

Women's empowerment (or women's involvement in household decisions) showed that women who are involved either solely or partially in key decisions regarding the household, in fact had higher children ever born than women who were not involved. As mentioned earlier, this somewhat contradicts existing literature, which finds that as women become more empowered their fertility decreases (Upadhyay et al., 2014; Bradley, 1995). However, the discussions and debates regarding what are included and what defines a woman when she is empowered has also been said to be contextual (Upadhyay et al., 2014). As such, simply being involved in household decisions may not necessarily translate into female empowerment in terms of decisions regarding desired number of children, sexual and reproductive health, and delaying or stopping child-bearing to pursue other interests or be able to provide attention to the children already born. This is because, as already discussed, that Ugandan society is predominantly pronatalist, and therefore decisions regarding fertility may favour a higher number of children than a lower number – even when it is women who are making the decision in this regard.

Only those women who lived within the richer or richest households showed an association with children ever born in both the adjusted and multi-level models. However, all models showed that women of a richer wealth status had on average 15% more children than their poorest counterparts. This was true except for the multi-level models that included in RH outcomes with the household outcomes in Models A, B and C. In these models, women of the richest households had on average 17% less children than their poorest counterparts. Literature has found that wealth status may go either way. In some contexts, it has been shown that wealth status has an inverse relationship with fertility (Colleran, Jasienska, Nenko, Galbarczyk & Mace, 2015), whilst in others increasing wealth leads to a decrease in fertility Therefore, wealth alone cannot explain variations in fertility, given that once other factors are controlled for the relationship between wealth status and fertility changes in the opposite direction. This is something that is discussed by Stulp and colleagues (2016), who suggest that wealth status often shows ambiguous results because the concept of wealth is multi-faceted and does not highlight the role of economic insecurity and hardships in

Women whose husbands wanted more children than they did and women who did not know whether their husbands wanted more / less / the same number of children were the two categories that showed significantly higher number of children ever born compared to those whose husbands wanted the same number of children. Literature has found that in both Nigeria and Uganda fertility desires between the husband and wife are often asymmetrical (Mott & Mott, 1985; Ntozi & Odwee, 1995), however it has also been found that at times partner's may use abuse to coerce partners into having more children, a term known as reproductive coercion (Miller, McCaw, Humphreys & Mitchell, 2015). As such, this may be contributing pattern that we find in the results of the present study. This shows that it is critical that partners are encouraged to engage in discussions and joint-decision making regarding fertility and reproductive health, given that women whose husbands wanted the same number of children as they did have the lowest fertility. However, if women are placed in a situation in which they feel that these conversations and discussions are either taboo or are not their decisions to be made, such as women in abusive relationships, this will circumvent any benefits from programmes that attempt to increase couple-decision making and open discussions regarding fertility. Such programmes, therefore, need to incorporate modules regarding abuse within the relationships that target both men and women.

The only variation at the community level that is worth noting is between urban and rural communities, which shows in the differences in the fertility levels amongst those that live in the Kampala region (Uganda's biggest urban region) compared to all other regions, which are predominantly rural. Thus, the variation seen within the regions, where significant, is more a repercussion of the rural / urban differentials than of the regional differences themselves. This is not contrary to what is known regarding rural and urban differentials in fertility in Uganda and elsewhere in that women living in rural areas have a higher fertility, in general, than those living in urban areas. However, most of this variation can be explained due to socio-economic conditions between the two areas, specifically in developing countries (Kulu, 2013). Women living in rural areas in Uganda consistently have higher children ever born that women living in rural areas. Given that many women live in rural areas, as seen in Chapter 4, this finding is worrisome. Coupled with the low educational status of women, the high prevalence of physical GBV and the high proportion of women first cohabitating at such young ages – fertility levels will continue to remain high. It is insufficient to attempt to decrease fertility levels by addressing only one of these challenges, given that in many ways they are interlinked.

Furthermore, in the multi-level models, the inclusion of GBV in each of the models increased the explanatory power of the models between-community variation without altering the effects of the other individual, household and community factors and the RH outcomes, although the variation seen in the within-community variances were less apparent. In the multi-level models, individual-level factors seemed to explain fertility and the influence of GBV on fertility, better than either the household or community-level factors. As such, a higher educational status, younger age at first cohabitation, higher wealth status, and higher percentages of community level of education has been shown to decrease fertility; as has having planned the previous pregnancy. On the other hand, being on traditional forms of contraception currently, having terminated a pregnancy, being employed, living in rural areas, having husbands that wanted more (compared to wanting the same), as well as experience of less and more physical GBV all acted to increase fertility levels. Thus, verifying earlier discussions on these results. One must be aware, however, that this is not a precarious situation in a context such as Uganda. Uganda, in general, shows high rates of fertility and value on children irrespective of geographical location, and therefore heterogeneity amongst different communities and groups are not varied given that the value of children and high fertility cuts across the country (Nalwadda, Mirembe, Byamugisha & Faxelid, 2010).

8.3.3 Discussion of the Direct and Indirect Pathways in which GBV Affects Fertility in Uganda

Pathway analysis was used to investigate possible direct and indirect pathways in which the two severities of physical GBV affects fertility. First and foremost, it should be noted that this is the first time that this methodology has been applied to this hypothesis, and therefore there is limited literature available on the topic. The literature that has been found is specific to pathway analysis of fertility, but not specific to its relationship with GBV. Furthermore, existing literature is somewhat outdated, yet their findings and conclusions are still relevant today.

The exogenous and endogenous factors included in each of the models is by no way exhaustive nor conclusive but does provide models in which to understand the pathways of how GBV in Uganda may be contributing to high and stalling fertility levels in the country. However, given the differences in the magnitude and outcome of each severity of physical GBV, the direct and indirect pathways in which each severity of physical GBV affects fertility levels is not the same. Each severity of physical GBV, in fact, works through different pathways in greater or lesser form to impact on children ever born.

Therefore, the exogenous factors work differentially and at varying levels through the RH outcomes to either increase or decrease the contribution to fertility but can also act directly on fertility as well. Furthermore, the varying levels in which the different severities of physical GBV affect fertility levels, is directly and indirectly influenced by the contribution of indirect pathways working from the exogenous (socio-demographic) factors to GBV, and then from GBV indirectly through the RH outcomes (or the endogenous factors) – which means that GBV is a mediator effect between the exogenous factors, RH outcomes and ultimately fertility. Although the analyses that preceded the path analysis showed the associations between the socio-demographic factors, RH outcomes, GBV and fertility outcomes, path analysis provided insight into the hypothesised causal pathway in which these factors act upon each other to ultimately affect fertility. All the models showed a reasonably good fit, and high predictive value but the coefficient of determination increased in the models that included less and more severe physical GBV, compared to the model that did not.

Factors that were included in the pathway analysis were those that conceptually showed a relationship with both GBV and fertility in the literature and theoretical models, but which also consistently showed to have a significant effect on fertility in the preceding multivariate analyses. Those factors that were, therefore, retained as the exogenous factors included age at first cohabitation, educational status, employment status, asymmetry of desired number of children, household wealth status, household decision-making, and place of residence. The three RH outcomes remained in the pathway model as the endogenous factors, together as less and more severe physical GBV as the endogenous moderator in model 2 and 3 respectively.

In all three models, higher household wealth and higher educational status had a direct influence in increasing the current use of contraception, whilst a higher age at first cohabitation, if husbands wanted less of more children than women, and living in rural areas had a direct influence in decreasing current contraceptive use directly. The greatest predictor of current use of contraception was place of residence, followed by household wealth status and educational status. This leads to the conclusion that the most important element that could be decreasing the use of contraception by Ugandan women of reproductive age is predominantly an access issue affecting rural areas more than urban areas – given that those who are in rural areas and are living in poorer households are those not currently using contraception. This, in fact, confirms the conclusions made by Buyinza and colleagues (2013) who found that poor women and women living in rural areas had lower levels of contraceptive use than their more wealthy and urban counterparts.

Educational status also opens the opportunity that women will have the knowledge of how contraception works, where to access it, but also by the mere fact that more educated women are known to want less children than those with less education and know the measures that need to be put in place to limit the number of births they have (Potts & Marks, 2001; Smith, 2004). However, the higher the education of a women, the more likely she is to live in an urban area and live in a household of higher wealth status than those with no or little education - quite simply experiencing elevated socio-economic benefits than those in rural areas (Kulu, 2013).

This shows the recursive relationship between these factors, and how it is important to assess how such factors impact on fertility outcomes together.

In model 1 (no GBV) current contraceptive method and asymmetry of desired number of children had significant direct pathways with the planning status of the previous pregnancy. The direct effect of asymmetry of desired number of children was marginal. On the other hand, although the effect was marginal, planning status of previous pregnancy was influenced by household wealth status, asymmetry of desired number of children, and place of residence. In total, the current use of contraception remained the greatest predictor of whether a previous pregnancy was planned or not. However, in the model with less and more severe physical GBV, the magnitude on the direct effect of current contraceptive use on planning status of previous pregnancy increased but the experience of less and more severe physical GBV also had a significant direct effect on whether women planned their previous pregnancy or not – and these were higher predictors of planning status of previous pregnancy than current use of contraception in both models. The indirect pathways in the model with less severe physical GBV remained as they were in the model with no GBV. On the other hand, place of residence was no longer a significant predictor of planning status of previous pregnancy. In total, both less and more severe physical GBV were the greatest predictors of whether a woman planned their previous pregnancy or not. This may give credence to the idea of reproductive coercion and the psychological effects of abuse. Women may be coerced to either stop or continue child-bearing, even if it is against their wishes (Miller, McCaw, Humphreys & Mitchell, 2015). In such cases, women may have fallen pregnant to please the husbands. Furthermore, reproductive coercion could also mean that such women are not taking contraceptives (Miller, McCaw, Humphreys & Mitchell, 2015), especially given the result of the present study than women whose husbands want more children than they do have higher children ever born.

Another major notable change from the model with no GBV, to the models with less and more severe physical GBV, was on the RH outcome of ever having had a pregnancy terminated. No significant pathways were noted in the model with no GBV, either directly, indirectly or in total. However, once less and more severe physical GBV was included, it showed a significant direct pathway to ever having had a pregnancy terminated. Those who experienced less severe physical GBV were more likely of experience a termination of pregnancy, while those that experienced more severe physical GBV were also more likely (though less in magnitude than those who experienced less severe physical GBV). This confirms with the literature on GBV and RH outcomes, in that the experience of such abuse negatively affects certain RH outcomes. Specifically, that women who experience physical GBV seek abortion service more often than women who do not experience abuse (Gee, Mitra, Wan, Chavkin & Long, 2009). Furthermore, in the model with less severe physical GBV, both age at first cohabitation and educational status – albeit marginal – showed significant direct pathways with ever having had a pregnancy terminated. In total, the highest predictor of ever having had a pregnancy terminated was the experience of less severe physical GBV. On the other hand, in the model with less severe physical GBV no indirect or total significant pathways were seen.

Age at first cohabitation, educational status and place of residence had significant direct and total pathways to the experience of less and more severe physical GBV. However, their overall magnitude and total contribution to experience of either severity of physical GBV differed. For the model with less severe physical

GBV, each of the endogenous factors had somewhat equal effect on experience of less severe physical GBV. On the other hand, place of residence followed by educational status, were much higher predictors of more severe physical GBV than age at first cohabitation.

Finally, when looking at the main outcome – fertility amongst Ugandan women of reproductive age – each of the models show high predictive value and reasonably good model fit. However, the introduction of less and more severe physical GBV amplifies the explanatory power of the model by 2% and changes the relative contribution of some of the major endogenous factors and RH outcomes in the models.

Directly, current contraceptive use increased children ever born 0.14 and indirectly 0.05in the model with no GBV, and 0.13 and 0.06 for both the other models, respectively. In total, current contraceptive use increased the children ever born by those currently using contraception 0.19 in the models with no GBV and less severe physical GBV, but 0.20 in the model with more severe physical GBV.

As planning status of previous pregnancy increased; the number of children ever born directly and in total decreased 0.92 in the model with no GBV and 0.90 when both severities of physical GBV were included. However, the effect of ever having had a pregnancy terminated was far less uniform across the different models. As having had a pregnancy terminated increased, the direct and indirect effect on children ever born decreased 0.74 when no GBV was included in the model, 0.70 in the model that included less severe physical GBV, and 0.72 in the model that included more severe physical GBV.

Both less and more severe physical GBV were directly, indirectly and in total significant and major predictors of children ever born – although more severe physical GBV much more so. Under the direct effect on children ever born, experience of less severe physical GBV increased children ever born 0.34 but more severe physical GBV increased children ever born 0.50. The indirect effect of either severity of physical GBV was the same – 0.12 for less severe physical GBV and 0.11 for more severe physical GBV. In total, the effect of less severe physical GBV showed a coefficient of 0.46 but a coefficient of 0.60 for more severe physical GBV. Each of these severities of physical GBV were one of the greatest predictors of children ever born in total, only preceded by place of residence – which we have seen has several factors that could explain such a high variation between those living in rural and urban areas, not precluding the higher levels of experience of less and more severe physical GBV in rural areas. In fact, Edwards (2015) does find that perpetrators of abuse in rural areas often perpetrate more chronic and severe abuse and victims in rural areas suffer worse from injuries given the lack of access to key services and support. Her results are from a critical review of literature regarding differences in intimate partner violence in rural and urban areas.

8.4 Strengths and Limitations of the Study

8.4.1 <u>Strengths of the Study</u>

This study used a high-quality, nationally representative survey with a large sample size. Therefore, not only is the study generalisable to the entire country and population but because the dataset comes from a group of multi-country and multiround surveys conducted in numerous developing countries – subsequent comparative studies will be feasible. This is specifically important given that this is the first time that a study has attempted to find the pathways in which less and more physical GBV acts upon several factors to affect fertility levels in a country. Until now, most of these relationships have been hypothesised at best, and the one study that is available (Odimegwu, Bamiwuye & Adedini, 2015) uses a limited methodology that does not assess the possible pathways in which these relationships work.

This, therefore, brings about the second strength in this study. The use of pathway analysis allows one to assess possible causal pathways. This is important, and a strength, in two ways. Firstly, given that the factors included in this study are not available in a longitudinal dataset – and although temporality cannot be determined – the causal pathways can be assessed with this methodology. Secondly, the literature has found parts of the hypothesised relationships between the RH outcomes, the socio-demographic factors and fertility – but none has used a methodology that allows an assessment of how, and to what magnitude, the different predictors, RH factors and outcomes work together to contribute to higher fertility levels in the country. The use of pathway analysis allows to bring the parts found in the literature into one coherent model, that could be used for further investigation and assessment regarding the complex relationship between GBV, the RH outcomes and fertility.

Furthermore, the slow fertility transition in sub-Saharan Africa, this study allows for a further caveat that may not have been included in previous fertility studies that could explain the persistently high fertility levels in the region. In fact, the inclusion of GBV into the model introduced by Bongaart’s allow for investigations – hitherto not conducted – that may increase the understanding of the African fertility transition. This is specifically since previous studies investigating the matter have not been able to draw conclusive evidence as to why the fertility transition is not occurring in many countries in the region. Uganda, specifically, is one such country.

The inclusion of a multi-level analysis on the fertility of Uganda is another strength. No studies, specifically on the contextual determinants of fertility in Uganda was found in the literature. Therefore, the inclusion of the household and community level factors, and the assessment of the between and within community variation further extends on the current literature on fertility in Uganda.

Finally, there are key factors in the study that have been hitherto uninvestigated, but which could aid policy and research recommendations for both Uganda and other countries where fertility and / or GBV prevalence rates are high. The interlink between age at first cohabitation, asymmetry of desired number of children, and – specifically – physical GBV is especially important; given that these factors have been found to interact with one another, as well as the RH outcomes, to influence fertility rates in Uganda. This could provide insight into how to architect national and sub-national policies and programmes, and key area that should be targeted to not only decrease fertility levels but the prevalence of physical GBV as well.

8.4.2 Limitations of the Study

There are a few limitations that should be outlined from the onset, these include the following:

- Due to the sensitive nature of questions regarding domestic violence, it could be that respondents may not have answered these questions truthfully, or in other cases may have exaggerated their effect. In such instances, GBV may have been underreported. However, all efforts were made in these situations to assure respondents of confidentiality for them to respond as honestly as possible and therefore the effect of such a bias should be minimal.
- As the DHS is a cross-sectional survey, causal relationships cannot be derived from the relationships of variables. However, the use of pathway analysis can establish the direct and indirect contribution or effect of GBV, and the other factors included in this study, establishing a theoretical and conceptual understanding of the relationship between these factors. To establish a causal effect, longitudinal data would be required – which in GBV does not exist in the sub-Saharan African region.
- Current contraceptive use does not establish consistency of use of contraceptive methods, which could affect the number of children ever born if the respondent has not used contraceptive methods correctly or consistently.
- Reports of children ever born could be over or under-reported at various ages. However, the use of indirect techniques (see Chapter 5) provides an assessment and overview of the quality of the data and assesses whether children ever born has in fact been under- or over-reported at various ages. In some previous years, some marginal under- and over-reporting was seen, but the marginal effect of these did not produce large differentials. In fact, indirect estimation methods show that reported data has been consistent before and including the 2011 UDHS.

- The variable *Ever had a pregnancy terminated* considers stillbirths, miscarriages and abortions as a termination of pregnancy even though the occurrence, reasons and consequences of a chosen abortion are different to those of stillbirths and miscarriages. Unfortunately, given that abortions are illegal in Uganda and that separating abortions from stillbirths and miscarriages may have yielded incomplete information, the three termination types were added into one question. Although it would have been preferable to separate them, inclusion of this variable still allows for an understanding of the relationship between pregnancy termination and GBV, as well as with fertility as stillbirths, miscarriages and abortions have all been shown to affect and be affected by the experience of GBV. Even though this is the case, termination of pregnancy – given the illegality of abortions in Uganda – may have been underreported.

CHAPTER NINE

CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

This section provides the summary of the key findings and conclusions of the study. Furthermore, the study's implications and recommendations for both policy and research are outlined in the sub-sections that follow, to chart the policies and programmes that are required in Uganda specifically to decrease both fertility levels and women's experience of less and more severe physical GBV. The frontiers of further research are provided as ways to investigate and refine on the findings of the current study, to better understand the conceptual model as well as the direct and indirect pathways identified as significant predictors of fertility – specifically physical GBV. Finally, the study's core contributions to knowledge are outlined in this section.

9.2 Summary of Findings and Conclusions

The overall objective of this study was to find the direct and indirect pathways in which GBV affects fertility levels in Uganda. More specifically, the study did this by first examining the levels and trends of fertility in Uganda, to assess the quality of the DHS data as well as to assess whether in fact Uganda has been experiencing a stall in fertility over the past 2 decades or simply a slow decline. Furthermore, the study examined the differentials of RH outcomes, GBV and fertility. The second sub-objective was to assess the extent to which individual/household and contextual factors contributed to variations in fertility in the country, and lastly to determine the direct and indirect effects of each severity of physical GBV on fertility; working with and through the exogenous and endogenous factors.

1) This study found that throughout the two previous decades leading to 2011 fertility in Uganda has not stalled but declined slowly (by around 1 child per women). It is therefore of utmost importance to investigate the factors and relationships between these factors that are contributing to this, and specifically factors that hitherto have not been investigated.
2) Ugandan women have a high rate of lifetime physical GBV in general, and a large percentage of Ugandan women experience either or both severities of physical GBV. Though the effect of GBV on children ever born varies according to the severity of physical GBV, the relationship between physical GBV and fertility is undeniable.
3) Women whom have experienced physical GBV have a higher number of children ever born. The patterns and pathways in which GBV affects fertility is different for each severity of physical GBV. It is therefore important to study each of them, rather than to investigate the incidence of violence in a relationship as though contributing factors of GBV work uniformly irrespective of the form of GBV.
4) Unmet need for contraception in Uganda is extremely high for all women, but it is particularly worrying that young women or women whom have not experienced fertility and those with lower parities are not using contraception to avoid early pregnancy and to limit births. The fact that many of these women have low education levels and are living in rural areas that have low access to family planning methods and measures,

may be contributing to this. Many of these women report to not have planned their previous pregnancy and to have had a pregnancy terminated. The urban advantage is evident and given that over 70% of Ugandan women in this study reported living in rural areas, this is an important conclusion. Furthermore, the high rate of terminated pregnancies and low levels of women on contraception, and the contribution this has on increasing fertility levels in the country means that measures need to be put in place that decreases the risk of pregnancy termination and increases the access and education of contraceptive methods available, which will ultimately decrease the number of children a woman has.

5) Extremely young ages at first cohabitation is contributing significantly to both high incidence of physical GBV (both less and more severe), as well as fertility levels in the country. Age at first cohabitation is therefore both a direct and indirect contributor to fertility. Most glaringly is that many Ugandan women are first cohabitating at early and late adolescent ages – decreasing their chances of completing education, assuring gainful employment, and allowing them the means to opportunities that could increase their empowerment and further decrease the risk of GBV and reach their desired family size.

There are ethnic and regional disparities in children ever born, but only at the bivariate stage. Furthermore, individual level factors explained the variations in fertility, whilst household and contextual factors did not provide much in terms of explaining the variations seen in fertility in the country. Therefore, cultural factors and beliefs associated with both having a larger family (which leads to higher fertility, and lower development – especially in a country that has not met its developmental objectives and aims) as well as allowing the abuse of women, which has major reproductive, mental, physical and (now known) fertility effects, may be explaining more of the stall in fertility in Uganda than the contextual factors included in this study.

6) Physical GBV is a moderating factor of fertility, influencing fertility rates both directly but also indirectly by moderating the effect of reproductive health outcomes. Physical GBV is also influenced by key socio-demographic factors – but specifically educational level, age at first cohabitation and place of residence. Although both less and more severe physical GBV was found to be influenced by these three socio-demographic factors, and both severities of GBV were found to influence fertility directly and indirectly through the three RH outcomes – the effects and magnitude were different. The total effect of each severity of GBV and how it influences the pathways towards increasing fertility must be taken into account in both research and policy moving forward.

9.3 Policy Implications and Recommendations

A decrease in fertility is not in and of itself the ultimate desired outcome. The desired outcome is to ensure that women are placed in situations that they can support themselves and their children, empowered with factors and opportunities that allow them an informed choice in having a smaller or larger family. Furthermore, by supporting and empowering women a cycle is created that can grow an economy and ensure healthy and productive children – and therefore has the long-term benefit for the country as well. Although minimal, there were some decreases in fertility from 1989 to 2011. One would expect that over this period, gains in women's empowerment and educational status would have led to even minimal decreases in fertility; which has not been the case.

Furthermore, results of this study show that there are high percentages of women not currently on contraception, and that most that are use these methods to space – rather than to limit - births. Therefore, policies and programmes in Uganda need to not only increase access to family planning measures as a standalone, but this needs to be complemented with policies and programmes that increase women's access and support to complete secondary schooling with the view of women entering sustainable and gainful employment. This will not only assure a decrease in fertility levels, but greater empowerment of women to reach and stop fertility when they reach their preferred family size. Linked to this is that the age at first cohabitation, on average, is extremely low – with high proportions of women cohabitating below the age of 15 and 19 years. Early age at first cohabitation is more a social norm than an anomaly in Uganda.

Unfortunately, the repercussions of such early ages at first cohabitation is that these women are at an increased risk of GBV and, in the long-run, higher number of unplanned pregnancies and higher fertility. Given the implications stated above, more forceful measures to diminish young age at first cohabitation – specifically when it is below the age of 15 and 18 – needs to be put in place and enforced. Furthermore, this must be complimented with behaviour change communication measures that negate young marriage and promote the education and empowerment of women. Such measures, although take long to create new social norms, are required to continue over long periods of time to assure that these changes occur. Women marrying or first cohabitating at older ages will increase the likelihood of completed (at least) secondary education, and further decrease fertility levels and experience of physical GBV. Many of these women may be having higher number of children due to a social or cultural pre-requisite, rather than an innate desire or want. Providing measures that will empower women would allow the diffusion of ideas regarding fertility and reproductive health outcomes, but also allow women to be able to decide for themselves their fertility desires and needs.

As a lesser developed country, economic growth will be a beneficial spin-off from such measures. In reinforcing such measures, and given that Ugandan is a highly rural country, policies and programmes need to ensure that a concerted effort is made to bridge inequalities between urban and rural areas in terms of access to education, access to family planning services, as well as access to sustainable and formal employment opportunities. Such measures must therefore concentrate more resources and attention to women living within rural areas, as well as regions in which this study found that fertility levels are high but contraceptive levels are low.

Lastly, but not least, this study has found a direct and indirect link between GBV and fertility levels in Uganda. Policies and programmes formulated to decrease fertility and allow women an opportunity to make informed choices and actions regarding their preferred family size as stated above, need to include as part of and a part thereof, measures and structures to combat GBV in the country. GBV on its own has been proven to have dire consequences to women’s reproductive health, but given the effect that it has on fertility levels in a country where fertility levels have remained high over the past two decades, programmes aimed at increasing women's educational status (including programmes at school), the behaviour change communication strategies to decrease the incidence of early age at first cohabitation, and family planning programmes at public health facility must all be complimented with pro-active measures dealing with violence in intimate relations. Furthermore, such measures aimed at women alone will not yield the desired results, programmes that include men should be targeted as well although more work needs to be done regarding partner relationships and asymmetries, as well as well as socio-demographic factors of perpetrators, to better architect such programmes.

9.4 Study's Contribution to Knowledge

The first contribution of this study to knowledge is specifically in relation to the investigation of fertility in Uganda. Although it is known that Uganda has been experiencing a stall in fertility, it has often been included in multi-country studies and studies specifically looking at HIV. This study, therefore, allows for a more in-depth understanding of the reasons for the stall of fertility in the country. There are several factors that show similar results to what is known to affect fertility around the globe – most notably educational status in that an increase in educational status definitively decreases the number of children ever born to Ugandan women of reproductive age and place of residence has both a massive direct and indirect effect on fertility levels amongst women in the country. However, there are several factors that have either hitherto not been investigated or which show differential results to what is known to occur in other countries.

Firstly, one would have expected that women's involvement in key household decisions, as a proxy for women's empowerment, would have seen a decrease in the fertility levels of women. In the Ugandan context however, this does not seem to be the case. In fact, the reverse seems to be true. Women involved in household decisions have a higher fertility than those not involved in household decisions. Furthermore, it is expected that employment status also provides somewhat of a protective effect, and acts to depress fertility levels – however, again, in the Ugandan context this is not the case. Those who are employed have a higher number of children ever born. On the other hand, contextual factors and ethnicity have been shown to influence fertility levels in other non-African as well as other sub-Saharan African contexts. In Uganda, this is not the case – the results of this study show that at the multivariate stage neither the contextual factors nor ethnicity showed variations in fertility. This, however, could be due to over-arching cultural value on children and larger families which cut across ethnic affiliation and geographic location.

The second contribution is the introduction of factors hitherto not assessed in fertility studies, both in fertility studies on Uganda but those conducted elsewhere as well. The most pertinent is the introduction of physical GBV, but specifically to understand how the severity of physical GBV experienced influences fertility experiences of women of reproductive age. The finding that physical GBV, in both its less and more severe forms, affects fertility has never been addressed this study shows that GBV is in fact a moderator that acts both directly and indirectly to affect fertility levels. Linked to this is the introduction of community level variables of less and more severe physical GBV. Even though these only showed significant effects in the bivariate analysis, it does open a sub-field of research that requires further investigation – the fact that social disorganisation at the community level may be increasing fertility levels in countries or areas where community level factors show more of an influence than they do in Uganda.

Asymmetry of desired number of children is another factor that has not been well investigated in fertility literature. In the Ugandan context, male preferences do impact on whether women have a higher or lower fertility levels – but perhaps the most important finding is that of households in which partners want the same number of children show the lowest fertility levels. This is important as it provides credence to the fact that programmes and policies must include male partners in their objectives, if the discussion regarding desired partner size does not include both the male and female partner, efforts to decrease fertility levels could be moderate at best. Both parties need to be involved in the decision-making process, and programmes need to encourage that these discussions occur in the home – given that one of the categories that had the highest fertility levels were amongst those women who did not know whether their husbands wanted the same / more / less children than they did.

Finally, and perhaps the greatest contribution of this study, is the conceptualisation and investigation of the model of fertility and GBV. The conceptual model is a reformulation of theoretical models used in fertility and those used to understand programmes to decrease violence in all forms. However, the reformulated conceptual model allows for studies in the future to understand the pathways and effects of the direct-indirect models, together with moderator factors that impact on both the direct and indirect factors of fertility – specifically of gender-based violence. Although, in this study, the conceptual model was used to understand the relationship between GBV and fertility, the reformulated conceptual model could be used to understand other key moderator-outcome relationships in the fields of fertility, mortality and migration amongst others.

Linked to this is the use of pathway analysis to assess such relationships, which has not often been used in the field of demography, those that have been conducted have not been done recently and none have been done in Africa. The pathway analysis methodology allowed for the investigation and testing of the conceptual model, but also allows for a better understanding as to how the proximate and indirect determinants work together to affect fertility rates in a country. This is in opposition to the use of normal regression models that simply show the association between factors, and not the hypothesised causal pathways. As a final note, no study has used this conceptual model nor the pathway analysis methodology to assess the effects of a moderator factor on fertility, such as GBV.

9.5 Future Research

Further studies are required on other contextual factors which may contribute to both the incidence of GBV, as well as on fertility levels in the country, but which were not included in this study. This is with specific reference to studies that could include cultural factors as variables to see whether the effect of socio-cultural factors add to the models herein.

Subsequent analyses could include partner-level factors and analyses on partner socio-demographic asymmetries to assess whether these influence GBV, the RH outcomes and ultimately fertility. Such studies could begin with the premise that given partner preferences and the fear of being violated, women bear more children to appease the husband and, in the hope, that this will decrease the incidence of violence in the relationship. Furthermore, nothing is known on the perpetrators of such violence, especially in country with high age at first cohabitation and where GBV is at such high levels. Therefore, complimented to studies looking at partner-level factors and asymmetries are studies on the actual perpetrators of GBV. This will allow for a better understanding of the socio-demographic make-up of the perpetrators and allow for better models of programmes that intend to focus on men as part of a larger strategy to un-normalise GBV, decrease levels of GBV in Uganda, and increase women's reproductive health options and decrease fertility levels in the country.

Path models included herein should be refined and investigated with other factors that may not have been included, but also in other contexts where pathways may differ – such as in South Africa which has lower fertility levels but high levels of GBV. This methodology has shown to have important results and aid in our understanding of how certain factors can not only directly influence, but indirectly influence, an outcome such as fertility. Specifically, with regards to the established link between GBV, the RH factors and the fertility levels in the country – refinement of the model, with factors that may not have been included in this study, may yield supplementary information that can help researchers, policy-makers and other experts in understanding the complex relationship between GBV and fertility and further aid in decreasing negative RH outcomes amongst women of reproductive age.

The definitive quantitative link has been found between GBV and fertility, however, qualitative studies are required to assess descriptively how this relationship works within intimate partnerships. Although this study provides important groundwork in understanding this complex relationship, the analyses conducted herein can only show associative relationships and cannot assess causation (though it is implied in the path analysis). Although qualitative studies may help in understanding how the relationship proceeds within the intimate partnership, longitudinal analyses would also greatly add to this contribution.

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APPENDICES

Appendix A: Synopsis of Selected Reviewed Literature on Fertility Issues in Sub-Saharan Africa

S/N	Title	Author(s) & year	Source	Data Source	Methods of Analysis	Findings	Missing Gaps
1	Estimating the Impact of Birth Control on Fertility Rate in Sub-Saharan Africa	Gafar T Ijaiya, Usman A Raheem, Abdulwaheed O Olatinwo, Munir-Deen A Ijaiya and Mukaila A Ijaiya (2009)	African Journal of Reproductive Health	African Development bank Selected Statistics (2007) and Population Reference Bureau World Population Data Sheet (2007 and 2008) - Cross-Country data from 40 countries	Multiple regression	Of all the birth control devices considered in the study only the withdrawal method was ineffective and did not have an impact on reducing fertility rates.	Did not look at socio-economic and demographic variables that could impact on fertility rates. Did not look at the role of men in decision-making. Did not look at access issues to family planning programmes.
2	Fertility, Contraceptive Choice, and Public Policy in Zimbabwe	Duncan Thomas and John Maluccio (1996)	The World Bank Economic Review	Data from the 1998 Zimbabwe DHS, Services Availability Survey and the Situation Analysis Study Data - Household survey data matched with two community level survey	Logistic Regression	A woman's education is a powerful predictor of both fertility and contraceptive use. These relationships are far from linear and have changed shape in recent years. After controlling for household resources, both the availability and quality of health and family planning services have an important impact on the adoption of modern contraceptives. In particular, outreach programs such as mobile family planning clinics and community-based	No analysis on the mechanisms that could underpin the correlations found in the study.

						distributors have been especially successful. However, not all women are equally served by this infrastructure	
3	Urbanization and Fertility Decline in West Africa: Ghana, Sierra Leone, and Liberia	Sylvi Dzegede (1981)	Journal of Comparative Family Studies	1960s censuses of Ghana, Sierra Leone, and Liberia, as well as the 1970 census of Ghana	Calculated fertility ratios in Urban and Rural areas	Urban as demonstrated by the census data does tend to be lower than fertility rural fertility in Ghana, Liberia, and Sierra Leone. Fertility does tend to decline as city-size increases in Ghana and Liberia but not in Sierra Leone. Much of the urban population of these three nations lies in the highest and lowest but not middle categories of city-size. West African nations do not exhibit parallel patterns of fertility related to urbanization according to these findings. Urbanization may explain a large proportion of Ghana's fertility decline from 1960 to 1970.	No multivariate analysis conducted to support claims that urbanisation may explain a large proportion of fertility decline. Did not control for the socio-economic variables that they purport could influence fertility levels, namely ethnicity, religion, socioeconomic status, education, migration, and age at marriage.
4	Socioeconomic factors affecting fertility in the developing countries and of the developing population groups in South Africa	W.P. Mostert and B.E. Hofmeyr (1988)	Southern African Journal of Demography	South African World Fertility Survey Questionnaire conducted by the HSRC.	Ordinary Least-Squares Regression	Although even the lowest levels of education leads to a reduction in fertility, marital fertility only decreases at very high levels of education. The level of female education increases the percentage of contraceptive users. Although urbanisation results in the lowering of marital fertility, desired family size and an increased use of contraception these trends are to a large extent influenced by socio-economic differences connected with type of residence.	Analysis was only conducted for coloureds and black population groups in South Africa, and not for other population groups.

5	Family Patterns, Women's Status and Fertility in the Middle East and North Africa	James Allman (1978)	International Journal of Sociology of the Family	A review of social science research and population wide studies		The paper reviews the state of knowledge in the following areas: choice of mate, age at marriage, the extended family, larger kinship structure, women's status, relations internal to the family and, finally, divorce, widowhood and re-marriage. Although a major problem is still lack of data in important areas, the orientation of studies should also be considered. There seems to be an overemphasis on values, norms and belief systems, and insufficient attention to empirical indicators of the impact of new institutions, the participation of people of the region in new social roles, and the problems faced in the development of new behaviour patterns.	No primary analysis conducted to substantiate the conclusions of the paper.
6	The Spread of Primary Schooling in Sub-Saharan Africa: Implications for Fertility Change	Cynthia B. Lloyd, Carol E. Kaufman and Paul Hewett (2000)	Population and Development Review	DHS for sub-Saharan African countries	Spline regression models	Since 1980, growth rates in grade attainment have slowed or halted; in some countries, these rates have even begun to decline in response to mounting economic difficulties. In countries at all levels of educational attainment, gender gaps are narrowing; in some, they have been largely eliminated and, in a few cases, reversed. In earlier years, this trend could be explained by relatively more rapid growth in educational attainment rates for girls than for boys. More recently, this trend has been accentuated	Authors do not look at the effects of higher educational levels and its implications for the fertility transition. It is not evident from the results whether female or male education is more effective in leading the way toward the fertility transition. It is not evident what aspect of education helps in decreasing fertility rates.

						by a cessation in growth rates for boys and, in a number of countries, a decline in these rates. In many cases, the narrowing of the gender gap is occurring at a point well below the achievement of mass schooling for either girls or boys. All countries that have achieved mass schooling also show evidence of having entered the fertility transition	
7	Women's Power and Fertility Transition: The Cases of Africa and the West Indies	W. Penn Handwerker (1991)	Population and Environment	Review of case studies of population studies from West Indies and Africa		An increase in women's opportunities and power creates generational conflict between parents, who adopt the view that child-bearing should be an investment activity, and offspring who do not. Fertility transition, therefore, depends on women's ability to pursue life goals independently of their child-bearing capacity.	No primary analysis conducted to substantiate the conclusions of the paper.
8	Fertility and Family Planning in Africa	Thomas E. Dow Jr. (1970)	The Journal of Modern African Studies	Review of available evidence and research on mortality and fertility rates in Africa		Recent declines in mortality are generating pressures within the African family. There is a growing awareness of the problems connected with large families, and a general desire for fertility control at some point short of fecundity. Fertility control is more or less limited to those Africans who are furthest along in the process of modernisation; their greater involvement in the urban-economic-educational structure is already highly	No primary analysis conducted to substantiate the conclusions of the paper.

						associated with knowledge, attitudes, and practices distinctly less 'pro-natal' than the average.	
9	Fertility Decline in Africa: A New Type of Transition?	John C. Caldwell, I. O. Orubuloye and Pat Caldwell (1992)	Population and Development Review	Ado-Ekiti Fertility Study, and review and comparison of other studies conducted in Nigeria	Calculation of percentages for each variable	Fertility decline has started in Africa. Sub-Saharan African family planning programs are most likely to succeed by making sure that contraceptives are plentifully available ;by recognizing that single women, especially teenage girls, have the greatest needs of all, and making it easy for them, or their boyfriends, to obtain contraceptives ; by specifically trying to meet the need for child spacing, and by recognizing that women will increasingly have to take the lead in urging contraception.	No multivariate analysis was conducted to see the association of family planning programmes and contraceptive use.
10	Fertility Declines Have Stalled in Many Countries in Sub-Saharan Africa	P. Doskoch (2008)	International Family Planning Perspectives	Article review		In 36 out of 40 developing countries review, no statistically significant decline in fertility has been shown between the last two surveys – suggesting that the fertility transition has stalled.	
11	The Fertility Transition in Africa	Ezekiel Kalipeni	Geographical Review	Population Reference Bureau Country-level data from 1980 and 1993	Pairwise t-test for means, analysis of variance, correlation analysis, and stepwise multiple-regression	Northern and Southern Africa are in the process of a fertility transition. Countries that scored very high on the HDI also experienced the greatest declines in fertility rates and had relatively lower fertility rates. Demographic and socioeconomic factors such as education, rural or urban residence, status of women,	Reasons for the stagnation or increase in fertility rates in central, west and east Africa are not studied.

						and use of contraceptives are important factors in determining the onset of the fertility transition. Over the long term, fertility will decline to acceptable levels as Africa continues to experience socioeconomic and cultural changes.	
12	Household Fertility Decisions in West Africa: A Comparison of Male and Female Survey Results	Frank L. Mott and Susan H. Mott (1985)	Studies in Family Planning	Interviews with all the locatable men and women of childbearing age in the community; this included 295 women aged 15 to 49 and 345 men gate results actually mask substantial differences of over the age of 15.	Univariate and bivariate analysis	The results suggest that, although the husband and wife responses on the family planning and achieved fertility items were generally similar, responses relating to prospective fertility intentions were very different between husbands and wives. The results are consistent with the notion that fertility intention orientations in this particular culture operate essentially on an individual and not a family level. Women, whether in monogamous or polygynous unions, have fertility preferences that, while normatively bound, are clearly individual preferences and not necessarily related to their husbands' desire	No multivariate analysis was conducted to see the association of women's and men's preferences with their behaviour patterns and fertility outcomes.
13	Introduction: Fertility in Sub-Saharan Africa	Martha Ainsworth (1996)	The World Bank Economic Review	Review of demographic and anthropological literature		Despite cultural influences, African fertility and contraceptive use are sensitive to policies associated with fertility decline elsewhere in the world. One of the strongest associations is the negative relation between female schooling and fertility – however there are differences marked by the quality of schooling, the labour market, child	No primary analysis conducted to substantiate the conclusions of the paper.

						health, family planning programs, and the status of women. High levels of child mortality remain an impediment to declining fertility. Desired family size in Sub-Saharan Africa is still high – between 4 and 6 children per women. Health and family planning services may inhibit or drive contraceptive use.	
14	Men, Women, and the Fertility Question in Sub-Saharan Africa: An Example from Ghana	F. Nii-Amoo Dodoo and Poem van Landewijk (1996)	African Studies Review	1988 Ghanaian DHS	Bivariate analysis	Including male preferences reduces currently accepted levels of unmet need by more than 50 percent. The study shows that when male preferences are considered, only 12 percent of the sample has a clear stopping need, and a further 21 percent has a spacing need. Much of these needs remain unmet. Of cases in which both parties want to cease childbearing, only 40 percent are using any form of contraception. An even smaller 24 percent use modem methods.	No multivariate analysis was conducted to see the association between men's and female's fertility preferences and actual fertility outcomes, and with other socio-demographic and health outcomes.
15	The Timing of the Fertility Transition in Sub-Saharan Africa	Michel Garenne and Veronique Joseph (2002)	World Development	40 World Fertility Surveys and Demographic and Household Survey Data	Calculated Age-Specific Fertility Rates by single year and age, computed date of onset of fertility transition (date at which cumulated	In most countries decline in fertility rates began before 1975 in urban areas, and began more or less 10 years later in rural areas – urbanisation playing a major role in fertility decline. Timing and speed of the fertility transition varied substantially across countries.	No analysis was done to verify the role of family planning in fertility decline, nor with other proximate determinants of fertility.

					fertility at age 40 started to decline), and speed of the fertility transition (date of onset until last point available, after fitting the decline with a curve)	Role of family planning programs in fertility decline have been important.	
16	Contradictions in Nigeria's Fertility Transition: The Burdens and Benefits of Having People	Daniel Jordan Smith (2004)	Population and Development Review	Ethnographic data collected over 20 months between 1995 and 1997	Qualitative data analysis	Kinship-based patronage systems remains important in Nigerian communities, and this keeps fertility rates high; even as the community becomes modernised. Although moderate, there is a move toward declining fertility – and this may be due to the increased desire in quality over quantity of children, and due to economic hardships experienced by families trying to educate their children.	Lack of quantitative data analysis renders the conclusions non-generalisable
17	Potential Effects on Fertility and Child Health and Survival of Birth-Spacing Preferences in Sub-Saharan Africa	Hantamalala Rafalimanana and Charles F. Westoff (2000)	Studies of Family Planning	Demographic and Health Survey data from 20 sub-Saharan African countries	Multiple Linear Regression Model	In Comoros, Ghana, Kenya, Rwanda, and Zimbabwe, women prefer much longer birth intervals than those they actually have, compared with women in the other 15 countries studied. The potential effects of spacing preferences on the level of fertility and on the prevalence's of short (less than 24 months) birth intervals and child malnutrition are greatest in the same five countries.	There is no data on why women's desired birth intervals where achieved, or whether they were unintended pregnancies.

						The covariates of preferred birth-interval lengths are also examined. In general, women who know, approve of, discuss, and use family planning prefer longer intervals than do their counterparts.	
18	The causes of educational differences in fertility in Sub-Saharan Africa	John Bongaarts (2010)	Vienna Yearbook of Population Research	Demographic and Health Survey data from 30 sub-Saharan African countries	Logistic regression	The results demonstrate that education levels are positively associated with demand for and use of contraception and negatively associated with fertility and desired family size. There are differences by level of education in the relationships between indicators. As education rises, fertility is lower at a given level of contraceptive use, contraceptive use is higher at a given level of demand, and demand is higher at a given level of desired family size. The most plausible explanations for these shifting relationships are that better-educated women marry later and less often, use contraception more effectively, have more knowledge about and access to contraception, have greater autonomy in reproductive decision-making, and are more motivated to implement demand because of the higher opportunity costs of unintended childbearing.	

19	Women's education and Fertility: Results from 26 Demographic and Health Surveys	Teresa Castro Martin (1995)	Studies in Family Planning	Data from 26 Demographic and Health Surveys	Univariate and bivariate analysis, and logit coefficients	Higher education is consistently associated with lower levels of fertility. Although there is great variability between the magnitude of the gap between upper and lower educational levels and its strength of association with fertility. As time goes by the education enhancing effect on fertility has decreased, although it does have an effect on desired family size and contraceptive use.	The study would benefit from introducing the community effect of education into the analysis to see whether community education has an effect on fertility.
20	Changes in the direct and indirect determinants of fertility	Kiersten Johnson, Noureddine Abderrahim, and Shea O. Rutstein (2011)	DHS Analytical Report	Data from 13 Demography and health Surveys in Sub-Saharan Africa	Total fertility rate, and descriptive statistics of the proximate and indirect fertility determinants in each country	In most countries, it is found that contraceptive use has been increasing, if only modestly, during the entire series of surveys. Benin and Ghana were the only countries where the fertility-reducing effect of contraception actually reversed between 2000-2004 and 2005-2009. However, fertility decline sometimes stalled, despite an increase in contraception, because of a countervailing trend in non-marriage or post-partum infecundity, predominantly the latter.	There is no cross-country comparison, and no multi-level modelling so that one cannot distinguish whether the indirect determinants have a bearing on the proximate determinants derived from the individual, household or community level. The analysis is not multivariate, in the sense of statistically articulating the roles of the direct and indirect determinants, and identifying precise pathways that connect them. Moreover, changes in the direct determinants were not consistent or monotonic, either between or across countries.

Appendix B: Tabular Results of the Brass P/F Ratio and Relational Gompertz Models

Table B1: Brass P/F Ratio Method Applied to Uganda DHS, 1989 - 2011

		Avg. CEB	Reported ASFR	Cumulative Fertility		ASFR	P/F	P2/F2	P3/F3	P4/F4	Avg. (P3/F3,P4/F4)
	Age	**P(i)**	**f(i)**	**Phi(i)**	**F(i)**	**f*(i)**	**P/F**	**f*(i)**	**f**(i)**	**f***(i)**	**f****(i)**
1989	15-19	0.384	0.188	0.942	0.433	0.219	0.885	0.205	0.222	0.217	0.219
	20-24	1.770	0.325	2.567	1.892	0.328	0.935	0.307	0.332	0.324	0.328
	25-29	3.629	0.329	4.213	3.579	0.326	1.014	0.305	0.331	0.323	0.327
	30-34	4.980	0.271	5.566	5.034	0.267	0.989	0.249	0.270	0.264	0.267
	35-39	6.653	0.234	6.735	6.322	0.223	1.052	0.209	0.227	0.221	0.224
	40-44	7.340	0.093	7.202	7.003	0.085	1.048	0.079	0.086	0.084	0.085
	45-49	7.861	0.037	7.386	7.343	0.029	1.071	0.027	0.030	0.029	0.029
	TFR		***7.386***					***6.909***	***7.489***	***7.307***	***7.398***
1995	15-19	0.407	0.204	1.020	0.473	0.237	0.860	0.211	0.211	0.235	0.223
	20-24	1.740	0.319	2.616	1.957	0.318	0.889	0.283	0.283	0.315	0.299
	25-29	3.181	0.309	4.162	3.572	0.305	0.890	0.271	0.272	0.302	0.287
	30-34	4.873	0.244	5.383	4.923	0.238	0.990	0.211	0.212	0.235	0.223
	35-39	6.063	0.177	6.270	5.944	0.170	1.020	0.151	0.152	0.169	0.160
	40-44	6.760	0.089	6.713	6.539	0.081	1.034	0.072	0.072	0.080	0.076
	45-49	7.496	0.029	6.858	6.824	0.023	1.098	0.020	0.020	0.022	0.021
	TFR		***6.858***					***6.096***	***6.106***	***6.789***	***6.448***
2000	15-19	0.312	0.178	0.890	0.405	0.210	0.772	0.203	0.197	0.208	0.203
	20-24	1.816	0.332	2.549	1.878	0.332	0.967	0.321	0.312	0.329	0.320
	25-29	3.250	0.298	4.038	3.458	0.295	0.940	0.285	0.277	0.292	0.284
	30-34	4.803	0.259	5.335	4.846	0.254	0.991	0.245	0.238	0.251	0.245
	35-39	5.898	0.187	6.269	5.938	0.177	0.993	0.171	0.166	0.175	0.171
	40-44	6.748	0.076	6.651	6.464	0.071	1.044	0.069	0.067	0.070	0.068
	45-49	7.089	0.040	6.852	6.805	0.033	1.042	0.032	0.031	0.033	0.032
	TFR		***6.852***					***6.625***	***6.439***	***6.792***	***6.616***

2006	15-19	0.224	0.152	0.761	0.343	0.180	0.652	0.181	0.193	0.199	0.196
	20-24	1.679	0.309	2.307	1.665	0.313	1.008	0.316	0.338	0.347	0.342
	25-29	3.488	0.305	3.832	3.238	0.302	1.077	0.305	0.326	0.335	0.330
	30-34	5.127	0.258	5.124	4.634	0.252	1.107	0.254	0.272	0.279	0.276
	35-39	6.236	0.190	6.075	5.726	0.182	1.089	0.184	0.197	0.202	0.199
	40-44	6.963	0.094	6.543	6.372	0.085	1.093	0.085	0.091	0.094	0.092
	45-49	7.713	0.026	6.673	6.642	0.020	1.161	0.020	0.021	0.022	0.022
	TFR		***6.673***					***6.728***	***7.189***	***7.383***	***7.286***
2011	15-19	0.242	0.134	0.670	0.295	0.161	0.820	0.153	0.166	0.174	0.170
	20-24	1.512	0.313	2.235	1.590	0.317	0.951	0.302	0.326	0.343	0.335
	25-29	3.216	0.291	3.690	3.129	0.286	1.028	0.272	0.294	0.310	0.302
	30-34	4.772	0.232	4.850	4.410	0.226	1.082	0.215	0.232	0.245	0.238
	35-39	6.103	0.171	5.705	5.399	0.163	1.130	0.155	0.167	0.176	0.172
	40-44	7.024	0.074	6.075	5.933	0.067	1.184	0.064	0.069	0.072	0.071
	45-49	7.310	0.023	6.190	6.163	0.018	1.186	0.017	0.018	0.019	0.019
	TFR		***6.190***					***5.887***	***6.361***	***6.698***	***6.530***

Table B2: Relational Gompertz Model Applied to Uganda DHS, 1989 - 2011

			Based on CEB only		Based on ASFR and CEB
	Reported TFR	2+2 points / CEB2	3+3 points / CEB3	2+2 points / ASFR2	3+3 points / ASFR3
1989	7.386	7.906	7.773	7.350	7.318
1995	6.858	7.360	7.640	6.501	6.604
2000	6.852	6.904	7.148	6.512	6.650
2006	6.673	7.079	7.919	6.800	6.896
2011	6.190	7.233	7.295	6.490	6.575

Appendix C: Tables of Results for the Adjusted Incidence Risk and Odds Ratios for Children Ever Born and Less and More Severe Physical GBV with Reproductive Health Outcomes and Each Level of Socio-Demographic Factors

Adjusted Regression Models for Children Ever Born with Reproductive Health Outcomes Only

Table C1: Adjusted Incidence Risk Ratios Children Ever Born with Reproductive Health Outcomes - No Gender-Based Violence [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.09	0.94 - 1.27	0.26
Modern Method	1.01	0.95 - 1.07	0.78
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.82 *	0.77 - 0.86	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.23 *	1.16 - 1.31	0.00

Table C2: Adjusted Incidence Risk Ratios Children Ever Born with Reproductive Health Outcomes - No Gender-Based Violence – Less Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Less Severe Physical GBV			
No	**RC**		
Yes	1.13 *	1.08 - 1.20	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.12	0.96 - 1.30	0.16
Modern Method	1.01	0.95 - 1.08	0.67
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.80 *	0.76 - 0.85	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.19 *	1.12 - 1.26	0.00

Table C3: Adjusted Incidence Risk Ratios Children Ever Born with Reproductive Health Outcomes - No Gender-Based Violence – More Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
More Severe Physical GBV			
No	**RC**		
Yes	1.18 *	1.11 - 1.26	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.11	0.95 - 1.29	0.20
Modern Method	1.01	0.95 - 1.07	0.76
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.80 *	0.76 - 0.85	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.19 *	1.12 - 1.26	0.00

Adjusted Regression Models for Children Ever Born with Individual Factors and Reproductive Health Outcomes

Table C4: Adjusted Incidence Risk Ratios Children Ever Born with Individual-level Factors and Reproductive Health Outcomes - No Gender-Based Violence [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.23 *	1.05 - 1.44	0.01
Modern Method	1.08 *	1.01 - 1.16	0.02
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.79 *	0.74 - 0.83	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.17 *	1.10 - 1.25	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	0.96	0.84 - 1.09	0.53
Musoga	1.02	0.90 - 1.16	0.72
Mukiga	0.97	0.83 - 1.12	0.63
Ateso	1.01	0.88 - 1.16	0.87
Other	0.98	0.89 - 1.07	0.61
Religion			
Catholic	**RC**		
Protestant	1.07	1.00 - 1.15	0.06
Muslim	1.04	0.95 - 1.14	0.41
Pentecostal	1.08	0.98 - 1.18	0.12
SDA	1.04	0.82 - 1.32	0.75
Other	1.06	0.80 - 1.40	0.69
Highest Education Level			
No education	**RC**		
Primary	0.73 *	0.68 - 0.79	0.00
Secondary	0.52 *	0.47 - 0.57	0.00
Higher	0.45 *	0.37 - 0.55	0.00
Employment Status			
Not employed	**RC**		
Employed	1.09 *	1.02 - 1.16	0.01
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.85 *	0.79 - 0.92	0.00
20-24 Years	0.86 *	0.79 - 0.95	0.00
25 and Above	0.83 *	0.70 - 0.99	0.04
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.11 *	1.03 - 1.20	0.01

Table C5: Adjusted Incidence Risk Ratios Children Ever Born with Individual-level Factors and Reproductive Health Outcomes – Less Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Less Severe Physical GBV			
No	**RC**		
Yes	1.09 *	1.02 - 1.15	0.01
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.23 *	1.05 - 1.45	0.01
Modern Method	1.08 *	1.01 - 1.16	0.02
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.79 *	0.75 - 0.84	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.16 *	1.09 - 1.24	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	0.94	0.82 - 1.07	0.37
Musoga	1.02	0.90 - 1.15	0.80
Mukiga	0.96	0.83 - 1.11	0.55
Ateso	0.98	0.85 - 1.13	0.77
Other	0.96	0.87 - 1.05	0.38
Religion			
Catholic	**RC**		
Protestant	1.08 *	1.01 - 1.16	0.03
Muslim	1.04	0.95 - 1.14	0.35
Pentecostal	1.08	0.98 - 1.19	0.10
SDA	1.05	0.83 - 1.33	0.70
Other	1.06	0.80 - 1.41	0.67
Highest Education Level			
No education	**RC**		
Primary	0.73 *	0.68 - 0.79	0.00
Secondary	0.52 *	0.47 - 0.58	0.00
Higher	0.46 *	0.38 - 0.56	0.00
Employment Status			
Not employed	**RC**		
Employed	1.09 *	1.02 - 1.17	0.01
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.85 *	0.79 - 0.92	0.00
20-24 Years	0.88 *	0.80 - 0.96	0.01
25 and Above	0.84 *	0.71 - 1.00	0.05
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.11 *	1.02 - 1.20	0.01

Table C6: Adjusted Incidence Risk Ratios Children Ever Born with Individual-level Factors and Reproductive Health Outcomes – More Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
More Severe Physical GBV			
No	**RC**		
Yes	1.11 *	1.03 - 1.18	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.23 *	1.05 - 1.45	0.01
Modern Method	1.08 *	1.01 - 1.16	0.03
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.79 *	0.75 - 0.84	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.16 *	1.09 - 1.24	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	0.95	0.83 - 1.08	0.42
Musoga	1.03	0.90 - 1.16	0.70
Mukiga	0.96	0.83 - 1.11	0.60
Ateso	1.00	0.87 - 1.15	0.97
Other	0.96	0.88 - 1.06	0.42
Religion			
Catholic	**RC**		
Protestant	1.08 *	1.00 1.16	0.04
Muslim	1.04	0.95 - 1.14	0.35
Pentecostal	1.09	0.99 - 1.19	0.09
SDA	1.05	0.83 - 1.33	0.68
Other	1.07	0.10 - 1.40	0.65
Highest Education Level			
No education	**RC**		
Primary	0.74 *	0.69 - 0.79	0.00
Secondary	0.53 *	0.47 - 0.58	0.00
Higher	0.46 *	0.38 - 0.56	0.00
Employment Status			
Not employed	**RC**		
Employed	1.09 *	1.02 - 1.17	0.01
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.86 *	0.80 - 0.92	0.00
20-24 Years	0.87 *	0.79 - 0.96	0.01
25 and Above	0.84 *	0.71 - 1.00	0.05
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.11 *	1.03 - 1.20	0.01

Adjusted Regression Models for Children Ever Born with Household Factors and Reproductive Health Outcomes

Table C7: Adjusted Incidence Risk Ratios Children Ever Born with Household-level Factors and Reproductive Health Outcomes - No Gender-Based Violence [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.21 *	1.03 - 1.42	0.02
Modern Method	1.03	0.96 - 1.10	0.46
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.81 *	0.77 - 0.86	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.18 *	1.10 - 1.26	0.00
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.95	0.88 - 1.03	0.23
Middle	0.93	0.85 - 1.01	0.10
Richer	0.97	0.89 - 1.06	0.54
Richest	0.70 *	0.64 - 0.77	0.00
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.23 *	1.14 - 1.33	0.00
Husband wants less	1.04	0.92 - 1.17	0.57
Don't know	1.22 *	1.13 - 1.32	0.00

Table C8: Adjusted Incidence Risk Ratios Children Ever Born with Household-level Factors and Reproductive Health Outcomes – Less Severe Physical GBV UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Less Severe Physical GBV			
No	**RC**		
Yes	1.09 *	1.03 - 1.16	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.22 *	1.04 - 1.43	0.02
Modern Method	1.03	0.95 - 1.10	0.48
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.81 *	0.77 - 0.86	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.17 *	1.09 - 1.25	0.00
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.96	0.88 - 1.04	0.28

Middle	0.94	0.86 - 1.02	0.15
Richer	0.99	0.91 - 1.09	0.90
Richest	0.72 *	0.65 - 0.79	0.00
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.22 *	1.13 - 1.32	0.00
Husband wants less	1.02	0.90 - 1.16	0.70
Don't know	1.22 *	1.13 - 1.32	0.00

Table C9: Adjusted Incidence Risk Ratios Children Ever Born with Household-level Factors and Reproductive Health Outcomes – More Severe Physical GBV UDHS, 2011]

		CEB	
	IRR	**95% CI**	**p-value**
More Severe Physical GBV			
No	**RC**		
Yes	1.13 *	1.05 - 1.21	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.22 *	1.04 - 1.43	0.02
Modern Method	1.02	0.95 - 1.10	0.53
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.81 *	0.77 - 0.86	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.17 *	1.10 - 1.25	0.00
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.96	0.88 - 1.04	0.35
Middle	0.94	0.86 - 1.03	0.18
Richer	1.00	0.91 - 1.10	0.99
Richest	0.73 *	0.66 - 0.80	0.00
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.22 *	1.13 - 1.32	0.00
Husband wants less	1.03	0.91 - 1.16	0.68
Don't know	1.22 *	1.13 - 1.32	0.00

Adjusted Regression Models for Children Ever Born with Community Factors and Reproductive Health Outcomes

Table C10: Adjusted Incidence Risk Ratios Children Ever Born with Community-level Factors and Reproductive Health Outcomes - No Gender-Based Violence [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.24 *	1.06 - 1.45	0.01
Modern Method	1.09 *	1.02 - 1.16	0.01
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.81 *	0.77 - 0.86	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.23 *	1.16 - 1.31	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.19 *	1.01 - 1.40	0.04
Central 2	1.28 *	1.09 - 1.51	0.00
East Central	1.28 *	1.09 - 1.50	0.00
Eastern	1.19 *	1.01 - 1.40	0.04
North	1.13	0.95 - 1.33	0.16
Karamoja	1.35 *	1.13 - 1.60	0.00
West-Nile	1.17	0.99 - 1.38	0.06
Western	1.24 *	1.05 - 1.46	0.01
Southwest	1.13	0.96 - 1.34	0.14
Place of Residence			
Urban	**RC**		
Rural	1.26 *	1.14 - 1.40	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.94 *	0.88 - 1.00	0.05
High	0.76 *	0.69 - 0.83	0.00
Community Level of Wealth			
Low	**RC**		
Medium	1.04	0.96 - 1.12	0.32
High	1.10	0.98 - 1.22	0.11
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	1.00	0.93 - 1.08	0.97
High	1.02	0.94 - 1.11	0.66
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	0.95	0.89 - 1.02	0.18
High	1.04	0.96 - 1.13	0.33

Table C11: Adjusted Incidence Risk Ratios Children Ever Born with Community-level Factors and Reproductive Health Outcomes – Less Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
Less Severe Physical GBV			
No	**RC**		
Yes	1.11 *	1.04 - 1.18	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.23 *	1.06 - 1.44	0.01
Modern Method	1.09 *	1.02 - 1.16	0.01
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.80 *	0.75 - 0.84	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.19 *	1.12 - 1.27	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.21 *	1.03 - 1.43	0.02
Central 2	1.26 *	1.07 - 1.49	0.01
East Central	1.26 *	1.07 - 1.48	0.01
Eastern	1.15	0.98 - 1.36	0.09
North	1.09	0.92 - 1.30	0.31
Karamoja	1.33 *	1.12 - 1.58	0.00
West-Nile	1.14	0.96 - 1.35	0.12
Western	1.24 *	1.05 - 1.46	0.01
Southwest	1.11	0.93 - 1.31	0.24
Place of Residence			
Urban	**RC**		
Rural	1.26 *	1.14 - 1.40	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.95	0.89 - 1.01	0.11
High	0.76 *	0.69 - 0.83	0.00
Community Level of Wealth			
Low	**RC**		
Medium	1.04	0.96 - 1.12	0.35
High	1.10	0.98 - 1.23	0.11
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	0.98	0.90 - 1.06	0.58
High	0.97	0.89 - 1.06	0.55
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	0.95	0.89 - 1.03	0.21
High	1.03	0.95 - 1.12	0.50

Table C12: Adjusted Incidence Risk Ratios Children Ever Born with Community-level Factors and Reproductive Health Outcomes – More Severe Physical GBV [UDHS, 2011]

	CEB		
	IRR	**95% CI**	**p-value**
More Severe Physical GBV			
No	**RC**		
Yes	1.14 *	1.07 - 1.22	0.00
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.23 *	1.05 - 1.44	0.01
Modern Method	1.09 *	1.02 - 1.16	0.01
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.80 *	0.75 - 0.84	0.00
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.19 *	1.12 - 1.27	0.00
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.21 *	1.03 - 1.43	0.02
Central 2	1.26 *	1.07 - 1.49	0.01
East Central	1.26 *	1.07 - 1.48	0.01
Eastern	1.16	0.98 - 1.37	0.08
North	1.09	0.92 - 1.29	0.34
Karamoja	1.32 *	1.11 - 1.58	0.00
West-Nile	1.14	0.97 - 1.35	0.12
Western	1.25 *	1.06 - 1.47	0.01
Southwest	1.11	0.94 - 1.32	0.22
Place of Residence			
Urban	**RC**		
Rural	1.25 *	1.13 - 1.39	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.95	0.89 - 1.01	0.10
High	0.76 *	0.69 - 0.83	0.00
Community Level of Wealth			
Low	**RC**		
Medium	1.03	0.96 - 1.11	0.39
High	1.09	0.98 - 1.22	0.12
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	1.00	0.93 - 1.08	0.91
High	1.02	0.94 - 1.11	0.62
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	0.94	0.87 - 1.01	0.08
High	0.98	0.89 - 1.07	0.66

Adjusted Regression Models for Less Severe Physical GBV

Table C13: Adjusted Odds Ratios for Less Severe Physical GBV with Reproductive Health Outcomes [UDHS, 2011]

	Less Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.48 *	0.23 - 1.00	0.05
Modern Method	0.75 *	0.58 - 0.98	0.04
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.74 *	0.59 - 0.93	0.01
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.46 *	1.12 - 1.90	0.01

Table C14: Adjusted Odds Ratios for Less Severe Physical GBV with Individual-level Factors and Reproductive Health Outcomes [UDHS, 2011]

	Less Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.64	0.28 - 1.45	0.29
Modern Method	0.90	0.66 - 1.23	0.53
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.72 *	0.56 - 0.94	0.02
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.60 *	1.19 - 2.16	0.00
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	2.87 *	1.56 - 5.26	0.00
Musoga	1.55	0.83 - 2.87	0.17
Mukiga	1.96	0.98 - 3.91	0.06
Ateso	5.96 *	3.09 - 11.48	0.00
Other	2.66 *	1.68 - 4.22	0.00
Religion			
Catholic	**RC**		
Protestant	0.69 *	0.50 - 0.95	0.02
Muslim	0.82	0.55 - 1.23	0.34
Pentecostal	0.76	0.45 - 1.10	0.20
SDA	0.67	0.23 - 1.97	0.46
Other	0.92	0.24 - 3.52	0.91
Highest Education Level			
No education	**RC**		
Primary	1.05	0.76 - 1.47	0.75
Secondary	0.65	0.42 - 1.02	0.06
Higher	0.27 *	0.10 - 0.74	0.01
Employment Status			

Not employed	**RC**		
Employed	0.84	0.63 - 1.12	0.24
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.86	0.61 - 1.22	0.41
20-24 Years	0.50 *	0.32 - 0.79	0.00
25 and Above	0.48	0.22 - 1.07	0.07
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.07	0.77 - 1.50	0.67

Table C15: Adjusted Odds Ratios for Less Severe Physical GBV with Household-level Factors and Reproductive Health Outcomes [UDHS, 2011]

	Less Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.61	0.27 - 1.36	0.23
Modern Method	0.91	0.66 - 1.26	0.58
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.73 *	0.56 - 0.94	0.01
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.53 *	1.14 - 2.06	0.01
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.80	0.56 - 1.15	0.23
Middle	0.60 *	0.40 - 0.88	0.01
Richer	0.34 *	0.23 - 0.52	0.00
Richest	0.30 *	0.20 - 0.45	0.00
Asymmetry for Desired Number of Children			
Both wants the same	RC		
Husband wants more	1.61 *	1.15 - 2.24	0.01
Husband wants less	1.87 *	1.12 - 3.12	0.02
Don’t know	1.19	0.85 - 1.67	0.31

Table C16: Adjusted Odds Ratios for Less Severe Physical GBV with Community-level Factors and Reproductive Health Outcomes [UDHS, 2011]

	Less Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.59	0.25 - 1.37	0.22
Modern Method	1.03	0.75 - 1.42	0.86
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.77	0.59 - 1.01	0.06
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.54 *	1.13 - 2.09	0.01
Community Factors			
Region			
Kampala	**RC**		
Central 1	0.89	0.42 - 1.88	0.75
Central 2	0.74	0.35 - 1.59	0.44
East Central	1.15	0.55 - 2.40	0.71
Eastern	1.40	0.67 - 2.92	0.37
North	1.63	0.76 - 3.49	0.21
Karamoja	1.39	0.63 - 3.06	0.41
West-Nile	1.28	0.60 - 2.73	0.53
Western	1.18	0.56 - 2.51	0.66
Southwest	1.32	0.62 - 2.79	0.47
Place of Residence			
Urban	**RC**		
Rural	1.02	0.62 - 1.67	0.94
Community Level of Female Education			
Low	**RC**		
Medium	0.90	0.66 - 1.25	0.54
High	1.12	0.72 - 1.73	0.62
Community Level of Wealth			
Low	**RC**		
Medium	1.03	0.73 - 1.47	0.85
High	1.06	0.61 - 1.85	0.83
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	3.42 *	2.34 - 5.01	0.00
High	11.58 *	7.61 - 17.61	0.00
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	1.39	0.98 - 1.97	0.07
High	1.27	0.88 - 1.84	0.22

Adjusted Regression Models for More Severe Physical GBV

Table C17: Adjusted Odds Ratios for More Severe Physical GBV with Reproductive Health Outcomes [UDHS, 2011]

	More Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.61	0.25 - 1.50	0.28
Modern Method	0.84	0.61 - 1.15	0.27
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.74 *	0.57 - 0.97	0.03
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.41 *	1.04 - 1.91	0.03

Table C18: Adjusted Odds Ratios for More Severe Physical GBV with Individual-level Factors and Reproductive Health Outcomes [UDHS, 2011]

	More Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.59	0.20 - 1.78	0.35
Modern Method	0.99	0.68 - 1.44	0.95
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.64 *	0.47 - 0.88	0.01
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.44 *	1.02 - 2.04	0.04
Individual Factors			
Ethnicity			
Muganda	**RC**		
Munyankole	2.95 *	1.32 - 6.61	0.01
Musoga	1.02	0.41 - 2.52	0.97
Mukiga	1.64	0.65 - 4.19	0.30
Ateso	2.66 *	1.16 - 6.09	0.02
Other	3.15 *	1.66 - 5.97	0.00
Religion			
Catholic	**RC**		
Protestant	0.74	0.51 - 1.08	0.12
Muslim	0.74	0.45 - 1.20	0.22
Pentecostal	0.47 *	0.27 - 0.82	0.01
SDA	0.52	0.11 - 2.37	0.40
Other	0.60	0.12 - 3.03	0.54
Highest Education Level			
No education	**RC**		
Primary	0.80	0.56 - 1.16	0.24
Secondary	0.34 *	0.19 - 0.61	0.00
Higher	0.09 *	0.01 - 0.72	0.02
Employment Status			

Not employed	**RC**		
Employed	0.88	0.63 - 1.23	0.44
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.75	0.50 - 1.10	0.14
20-24 Years	0.62	0.37 - 1.05	0.07
25 and Above	0.49	0.17 - 1.37	0.17
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	0.85	0.58 - 1.26	0.42

Table C19: Adjusted Odds Ratios for More Severe Physical GBV with Household-level Factors and Reproductive Health Outcomes [UDHS, 2011]

	More Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.64	0.21 - 1.92	0.43
Modern Method	1.06	0.72 - 1.58	0.76
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.72 *	0.53 - 0.98	0.04
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.36	0.96 - 1.92	0.09
Households Factors			
Wealth Status			
Poorest	**RC**		
Poorer	0.72	0.48 - 1.06	0.09
Middle	0.51 *	0.32 - 0.79	0.00
Richer	0.24 *	0.14 - 0.41	0.00
Richest	0.17 *	0.09 - 0.30	0.00
Asymmetry for Desired Number of Children			
Both wants the same	**RC**		
Husband wants more	1.69	1.12 - 2.56	0.01
Husband wants less	1.48	0.78 - 2.79	0.23
Don’t know	1.40	0.92 - 2.14	0.11

Table C20: Adjusted Odds Ratios for More Severe Physical GBV with Community-level Factors and Reproductive Health Outcomes [UDHS, 2011]

	More Severe Physical GBV		
	OR	**95% CI**	**p-value**
Reproductive Health Outcomes			
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	0.75	0.28 - 1.99	0.56
Modern Method	1.13	0.78 - 1.64	0.53
Intention of Previous Pregnancy			
Birth Not Planned	**RC**		
Birth Planned	0.70 *	0.51 - 0.96	0.03
Ever Had a Pregnancy Terminated			
No	**RC**		
Yes	1.53 *	1.09 - 2.15	0.02
Community Factors			
Region			
Kampala	**RC**		
Central 1	1.17	0.43 - 3.17	0.76
Central 2	0.87	0.31 - 2.44	0.79
East Central	1.35	0.50 - 3.64	0.55
Eastern	1.42	0.52 - 3.88	0.49
North	2.23	0.82 - 6.05	0.12
Karamoja	2.22	0.79 - 6.23	0.13
West-Nile	1.76	0.65 - 4.79	0.27
Western	0.97	0.35 - 2.67	0.95
Southwest	1.38	0.50 - 3.83	0.54
Place of Residence			
Urban	**RC**		
Rural	1.34	0.75 - 2.39	0.33
Community Level of Female Education			
Low	**RC**		
Medium	0.89	0.62 - 1.27	0.51
High	1.00	0.57 - 1.76	1.00
Community Level of Wealth			
Low	**RC**		
Medium	1.26	0.83 - 1.90	0.28
High	1.45	0.74 - 2.82	0.28
Community Level of Less Severe Physical GBV			
Low	**RC**		
Medium	0.83	0.51 - 1.35	0.45
High	1.16	0.70 - 1.91	0.57
Community Level of More Severe Physical GBV			
Low	**RC**		
Medium	5.78 *	3.47 - 9.61	0.00
High	15.39 *	8.96 - 26.43	0.00

Appendix D: Turnitin Report

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