DOMESTIC VIOLENCE DURING PREGNANCY IN UGANDA

THE SOCIAL CONTEXT, BIOMEDICAL CONSEQUENCES AND RELATIONSHIP WITH INDUCED ABORTION

DAN K. KAYE

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The Social Context, Biomedical Consequences and the Relationship with Induced Abortion.

Dan K. Kaye
Science is built up with facts as a house with stones. 
But a collection of facts is no more science than a heap of stones.

La Science et l’Hypothèse (Jules Henri Poincaré, 1908)

The logic of scientific reasoning is to uncover the truth. 
We have two tools at our disposal to pursue scientific inquiry:
- Our senses through which we experience the world and make observations.
- Our ability to reason which enables us to make logical inferences 
  We impose our logic on these observations.

Wassertheil-Smoller S. 1995
ABSTRACT

Background
The 2000/2001 Uganda Demographic and Health Surveillance report indicated that domestic violence, unwanted pregnancies and induced abortion were common Reproductive Health problems in Uganda. Women’s and men’s perception of domestic violence or linkage of violence to reproductive ill-health was not known as no prior studies had explored pregnancy-related adverse effects.

Objectives
The general objective was to investigate the social context and biomedical consequences of domestic violence during pregnancy. Specifically, the objectives were to determine the prevalence and predictors of domestic violence during pregnancy; explore community perceptions of factors associated with domestic violence in Wakiso district of Uganda; explore pregnant adolescents’ experiences and coping strategies regarding violence; investigate association between pregnancy intention, domestic violence and induced abortion; and investigate whether domestic violence during pregnancy is associated with obstetric complications (leading to antepartum hospitalization) or low birth weight (LBW) delivery.

Methods
The study involved use of both qualitative and quantitative research methods.
- Paper I was a cross-sectional study among 379 women attending antenatal clinic in Mulago hospital from January through May 2000 to assess risk factors, nature and severity of domestic violence during pregnancy. Domestic violence was assessed with the Abuse Assessment Screen (AAS) and the Severity of Violence against Women (SVAW) scale.
- Paper II and III are based on results from a qualitative study conducted from August to December 2003 in Wakiso district using triangulation of data collection methods. Data was analyzed by thematic content analysis.
- Paper IV is based on a qualitative study involving 16 in-depth interviews with pregnant adolescent domestic violence survivors conducted from January to May 2004. Theoretical sampling was done for participant selection and Grounded theory was used during data analysis.
- Paper V is from a case-control study conducted in Mulago hospital, Kampala, Uganda, from September 2003 through June 2004, among 942 women seeking post-abortion care. Stratified and multivariate logistic regression analyses were used to adjust for confounding and interaction at the 95% confidence level. The relationship between domestic violence, pregnancy intention and induced abortion was assessed. The reasons, methods and decision-making process for pregnancy termination for adolescents and older women were also compared.
- Paper VI was a prospective cohort study in Mulago hospital antenatal clinic and labour ward from May 2004 through July 2005. The relative and attributable risk of LBW and antepartum hospitalization (following maternal complications) were estimated using multivariate Poisson and logistic regression, adjusting for confounding by age, parity, number of children, pregnancy planning and domicile.

Results
In Paper I, we showed that over 57% of participants reported moderate to severe domestic violence. Abuse or witnessing abuse in childhood, being an adolescent and carrying the first pregnancy were significantly associated with domestic violence in pregnancy (p<0.01).
In paper II and III, bride price, urban migration, changing cultural values due to modernization, men’s unemployment (associated with women employment and financial as well as legal empowerment), failure to negotiate sexual relations, disagreement on household division of labor and misconceptions about pregnancy changes were associated with domestic violence. Family and social institutions offered minimal protection and often perpetuated violence.

In Paper IV, coping strategies employed by pregnant adolescent survivors were minimizing damage-decreasing severity of violence, withdrawal- physical or social withdrawal, seeking help and retaliation (fighting back). These were influenced by pregnancy more than adolescence.

In Paper V, women with induced abortion were over 8 times more likely to have unwanted pregnancy [OR 8.85 (95% CI 6.33-12.40), p<0.001], and were 18 times more likely to report domestic violence [OR 18.7 (95%CI 11.2-31.0); p<0.001] after adjusting for age, pregnancy intention and marital status. Domestic violence was one of the main reasons in decision-making for pregnancy termination for the women seeking postabortion care after induced abortion.

In Paper VI, women exposed to domestic violence delivered babies with a mean birth weight 2647.5 ± 604 g, on average 186g [(95%CI 76-296); p=0.001] lower than those not exposed to violence. After adjusting for potential confounding due to maternal age, parity, number of living children, nature of prior pregnancy, pregnancy planning, domicile and household decision-making, the relative risk of LBW delivery was 3.78 (95% CI 2.86-5.00). Such women exposed to domestic violence had a 37% higher risk of antepartum hospitalization [RR 1.37 (95%CI 1.01-1.84)]. HIV status was not a significant confounder. The population attributable risk estimates from our study indicates that 19% of LBW and 74% of antepartum hospitalization among pregnant women in Kampala could be attributable to domestic violence.

**Conclusions**
Moderate to severe domestic violence is common in pregnancy. Physical abuse is often associated with both sexual and psychological abuse. Bride price payment was associated with domestic violence, and had serious perceived sexual and reproductive health implications for women. Coping strategies adopted by pregnant adolescent survivors involve problem-focused and emotion-focused approaches that are markedly influenced by adolescence and pregnancy. Domestic violence during pregnancy is a risk factor for unwanted pregnancy and induced abortion in Mulago hospital. It is also a risk factor for both low birth weight delivery and antepartum hospitalization.

**Key words:** Adolescents; Pregnancy; Domestic violence; Coping strategies; Social construction; Social context; Induced abortion; Decision-making; Low birth weight; Obstetric complications; Hospitalization, Risk factors; Uganda.
LIST OF PUBLICATIONS

The thesis is based on the following papers, referred to in the text by their Roman numerals.*

I  Kaye D, Mirembe F, Bantebya G.
Risk factors, nature and severity of domestic violence among women attending antenatal clinic in Mulago hospital, Kampala, Uganda.
*Central African Journal of Medicine 2002; 48 (5/6): 64-68

II  Dan K. Kaye, Florence M. Mirembe, Anna Mia Ekstrom, Grace Bantebya, Annika Johansson.
The social construction and context of domestic violence in Wakiso District, Uganda
*Culture, Health and Sexuality 2005; 7(6): 625-635

III  Dan K. Kaye, Florence M. Mirembe, Grace Bantebya, Anna Mia Ekstrom, Annika Johansson.
Implications of bride price for domestic violence and reproductive health in Wakiso District, Uganda.
*African Health Sciences 2005; 5(4): 300-303

IV  Dan K. Kaye, Grace Bantebya, Anna Mia Ekstrom, Annika Johansson, Florence M. Mirembe.
Escaping the triple trap: Coping strategies of pregnant adolescent domestic violence survivors in Mulago Hospital, Kampala, Uganda.

V  Dan K. Kaye, Florence M. Mirembe, Grace Bantebya, Annika Johansson, Anna Mia Ekstrom.
Domestic violence as a risk factor for unwanted pregnancy and induced abortion in Mulago hospital, Kampala, Uganda
*Tropical Medicine and International Health 2006; 11 (1): 90-101

VI  Dan K. Kaye, Florence M. Mirembe, Grace Bantebya, Annika Johansson, Anna Mia Ekstrom.
Domestic violence during pregnancy and risk of low birth weight and maternal complications: a prospective cohort study at Mulago hospital, Uganda
(Resubmitted after revision to Tropical Medicine and International Health)

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<tr>
<td>ACOG</td>
<td>American College of Obstetricians and Gynaecologists</td>
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<td>ACTH</td>
<td>Adrenal corticotrophic hormone</td>
</tr>
<tr>
<td>ANC</td>
<td>Antenatal Clinic</td>
</tr>
<tr>
<td>AOR</td>
<td>Adjusted Odds ratio</td>
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<tr>
<td>ARR</td>
<td>Adjusted relative risk</td>
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<tr>
<td>Beta E</td>
<td>Beta endorphins</td>
</tr>
<tr>
<td>CDC</td>
<td>Centre for Disease Control, Atlanta, GA, United States of America</td>
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<tr>
<td>CI</td>
<td>Confidence interval</td>
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<tr>
<td>CRH</td>
<td>Corticotrophin releasing hormone</td>
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<tr>
<td>GLM</td>
<td>Generalised linear model</td>
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<tr>
<td>FGD</td>
<td>Focus group discussion</td>
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<tr>
<td>FIDA</td>
<td>International Federation of Women Lawyers (Uganda chapter)</td>
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<tr>
<td>KII</td>
<td>Key informant interview</td>
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<td>LBW</td>
<td>Low birth weight</td>
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<tr>
<td>LR</td>
<td>Likelihood ratio</td>
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<tr>
<td>mRNA</td>
<td>Messenger RNA</td>
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<tr>
<td>OR</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>Ref</td>
<td>Reference group</td>
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<tr>
<td>RH</td>
<td>Reproductive Health</td>
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<tr>
<td>RR</td>
<td>Relative risk</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences (data analysis software)</td>
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<tr>
<td>SRHR</td>
<td>Sexual and Reproductive Health and Rights</td>
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<tr>
<td>SVAW</td>
<td>Severity of Violence Against Women (scale)</td>
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<td>UBS</td>
<td>Uganda Bureau of Statistics</td>
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<tr>
<td>UDHS</td>
<td>Uganda Demographic and Health Survey</td>
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<td>WHO</td>
<td>World Health Organization</td>
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1 INTRODUCTION
During the last decade, there has been increased interest in issues related to violence against women, especially consequences and implications for Reproductive Health. Consequently, domestic violence has received wide international recognition and attention. Domestic violence affects women in many countries, in different social contexts regardless of age, education, religion, ethnicity, socio-economic status, occupation, sexual orientation or personality (Heise et al 1999). Worldwide, only a few countries have issues of violence incorporated into Reproductive Health services or policies. In particular, there is hardly any linkage (in most countries) at the service level, despite some attempts to establish linkage at policy level. Where such services are available to address issues of violence against women, they are seldom integrated into reproductive health services. In even fewer countries is there a multi-sectoral response. This is partly due to scarcity of local or international data providing the link between violence against women and reproductive ill health.

Whereas most research on domestic violence does not specify the age of the women involved, a few studies indicate that the study population is women of reproductive age (Heise et al 1994 and 1999). Few studies have been done among pregnant women, a few of these from low and middle income countries, and even fewer from sub-Saharan Africa. The majority of such studies were hospital or clinic based. Most population-based studies have not focused on pregnant women in particular. Domestic violence is a multi-factorial problem with far-reaching socio-economic and biomedical consequences, some of which currently are not well understood. Therefore, research on domestic violence requires a multifaceted approach involving qualitative and quantitative research methodologies in order investigate the multi-dimensional explanations of this problem in different social contexts and vulnerable populations.

In this thesis, domestic violence is used synonymously with abuse, and encompasses physical, sexual and psychological (or emotional) violence. This violence is often referred to as battering or intimate partner violence (in the context where such violence occurs in intimate relationships). The classification of domestic violence is merely a theoretical construct, as the different types of violence are not easy to separate from one another (Wijma et al 2004). For instance, physical violence may have emotionally abusive aspects. Likewise, physical abuse is often associated with emotional or psychological violence and sexual abuse is closely linked with physical abuse (Heise et al 1999; Krug et al 2004). The differences in definition and nomenclature have implications on research on violence.

This thesis explores the social context and the construction of domestic violence by the community in Wakiso district. It explores the intersection of domestic violence and induced abortion. It further provides evidence of the association between domestic violence and adverse pregnancy outcomes. The thesis seeks to add to the available evidence of the linkage between domestic violence and adverse reproductive health, thus emphasizing the need to integrate domestic violence into Sexual and Reproductive Health and Rights (SRHR). The research involved methodology triangulation in which qualitative and quantitative methods were used, each answering specific research questions. The findings highlight the opportunities for developing an active response to domestic violence within reproductive health services, through setting up services for women presenting with pregnancy-related reproductive ill health.
2.0 LITERATURE REVIEW

The American College of Obstetricians and Gynaecologists defines domestic violence as "any act that is intended, or perceived to be intended, to cause physical or psychological harm by people related through blood, intimacy or law (ACOG 1995). The World Health Organization (1997) defines domestic violence as: “the range of sexually, psychologically and physically coercive acts used against adult and adolescent women by current or former male intimate partners.” Domestic violence may occur whenever women attempt to assert control so as to overcome inequality, and is a manifestation of existing gender inequalities, which may be social, sexual or economic (United Nations 1999).

Domestic violence is also a gender issue. Gender is the social construction of power relations between men and women and the implication of these relations for individual identity, values, roles and responsibilities. Gender relations are historically, geographically and culturally context-specific. They are socially constituted and sanctioned by existing and changing norms and values, and are associated with defined notions of masculinity and femininity, and behaviour considered appropriate for each gender. They are reinforced by cultural beliefs and differential access to (or control of) socially valued resources. In situations of cultural and socio-economic change, new norms, values and expectations emerge. Being largely products of social and cultural processes, gender relations are neither universal nor static but dynamic and changeable. Being a cultural, social and psychological construct, gender is embedded into the dominant cultural or ideological framework and values of a given society.

2.1 CLASSIFICATION OF DOMESTIC VIOLENCE

Though widespread worldwide, domestic violence tends to be private in nature, which makes it difficult to quantify its prevalence, understand its risk factors or address its consequences. Many cultures hold that men have the right to control not only women’s income but also their behavior (United Nations 1989), and women disobey or transgress gender norms get punished, something that in many societies is culturally justified (Counts et al 1999). In order to analyze data from different perspectives, domestic violence is classified in different ways (Barzellato 1998; Heise et al 1999; Tjadden & Thoennes 2000; Krug et al 2002; Krantz 2002; Krantz et al 2005). All the classifications have limitations and advantages. They include:

i) Using characteristics of the assailant and victim (or survivor) such as age, sex or life cycle. This leads to classification such as child abuse, adolescent abuse, intimate partner abuse and elder abuse

ii) The nature or form the violence takes. Here violence may be classified as sexual abuse, physical assault (battering or physical abuse), emotional abuse (also referred to as psychological abuse)

iii) According to intent (motivation)

iv) According to its effects such mortality (suicide, homicide, infanticide or feticide), morbidity (injuries caused) or adjusted average years of life lost

v) Setting of occurrence (urban/rural, domestic/office, public/private life)

vi) The relationship between the survivor and the aggressor (self-inflicted or interpersonal injury).

2.2 MAGNITUDE OF DOMESTIC VIOLENCE

Reported figures of domestic violence give an indication of the magnitude of domestic violence in a given country or population. Such figures vary widely and may indicate differences in actual prevalence, definition of what constitutes domestic violence, research question and methodology used to collect data on domestic violence, sampling technique
that was employed, interviewer training skills and cultural differences between communities (Heise et al 1999; Swahnberg 2004). The latter affect respondents’ willingness to reveal intimate partner experiences. Studies have lacked consistency in design, collection or even interpretation of data on domestic violence.

From 50 population-based surveys worldwide, 10% to 50% of women report being hit or physically harmed by an intimate male partner at some time in their lives (Heise et al 1999). From this review, physical violence is often associated with psychological and sexual abuse. Physical acts more severe than slapping, shoving, pushing or throwing objects often constitute “severe” violence (Heise et al 1999). Forty-seven percent of women in Bangladesh and 35% of women in Pakistan report a history of physical abuse (Heise et al 1999). In Africa, studies from Kenya, Zambia and Uganda showed that 42%, 40% and 46% (respectively) of women were physically abused by their partners (Heise et al 1999). A community survey of women of reproductive age in Lira and Masaka districts of Uganda showed that 41% of the women reported beating or other physical harm by partners (Blanc et al 1995).

2.3 SEVERITY OF DOMESTIC VIOLENCE

Straus (1979) proposed a scoring system for assessing severity of intra-family violence. This Conflict Tactics Scale, though widely used, has been criticized for its inability to measure the emotional abuse or the danger to which survivors are exposed. To overcome this, Tolman (1985) developed a scale to measure the psychological maltreatment of among victims of abusive relationships. The fear, anxiety, fatigue, depression, stress-related complaints and sleeping disorders may be more debilitating than the physical/sexual violence injuries. Marshall (1992) proposed a scoring system which takes incorporates the physical or emotional impact of the injuries, the frequency of such episodes and an assessment of the danger to which survivor is exposed. This scale divides the severity of domestic violence into symbolic violence, threatening violence, overt violent episodes (mild, moderate or severe) and use of a weapon.

1.4 RISK FACTORS FOR DOMESTIC VIOLENCE

The factors that influence a culture of violence can be classified into originating, promoting and facilitating factors. According to Barzellato (1998), violence originates in a breakdown of social integration mechanisms. It starts with a weakening of the role of the family in socializing children. The nuclear family structure that predominates in most countries today reduces the chance of transmitting positive values to children. Where one or both parents do not stay at home with children for long, children miss the authority figures that may be role models (unlike in extended families, where other family members carry out this role). Violence is promoted by absence of mechanisms for peaceful resolution of conflict. Poverty per se does not generate violence, but increasing relative deprivation and frustrated expectations do (Barzellato 1998).

Several studies on physical abuse in pregnancy (Hillard 1985; Helton et al 1987; Stewart & Cecutti 1993; Gazmararian et al 1996) have identified factors such as poverty, low socio-economic status, (Helton et al 1987; Editorial 1990; Council Report 1992; McFarlane et al 1992; Gazmararian et al 1996; Burge 1998; Kaye et al 2002); and substance abuse (Amaro et al 1990; Bohn 1990; Berenson et al 1991) which are associated with domestic violence. Domestic violence has also been associated with drug/substance abuse and excessive drinking of alcohol (Amaro et al 1990). Chronic use of these substances impairs the sense of fine discrimination and fair judgment. Such behavior may be due to greater levels of stress (Barzellato 1998) associated with violence-related victimization.
2.5 MAGNITUDE OF DOMESTIC VIOLENCE DURING PREGNANCY

The levels of domestic violence may be measured in terms of the magnitude (prevalence or incidence), the nature/type of physical abuse, the types of injury sustained, the weapon use or the risk of danger to the victim and psychological morbidity (Ballard et al 1998). What is often reported in the literature is lifetime history of domestic violence which does not desegregate data between pregnant women and all women of child-bearing age.

In a review of 13 studies on women who were pregnant at the time of the survey, Gazmararian et al (1996) found a lifetime prevalence of 9.7% to 29.7%, and a prevalence 0.9% to 20.1% for domestic violence during pregnancy. A recent literature review of the prevalence of violence during pregnancy in North America (Jasinski 2004) showed prevalences that have remained within this range in this setting. In contrast, Campbell et al (2004) found prevalences ranging from 3.4%-11.0% in industrialized countries outside North America, and (ranging from) 3.8%-31.7% in developing countries. In a study of pregnant women on their index antenatal visit, the prevalence of violence before and during pregnancy was 40.7% and 57.1% respectively for 379 women (Kaye et al 2002). The wide range in magnitude may be due to differences in definition or measurement of domestic violence in different researches, or real differences in characteristics of the population that is studied that could influence risk or vulnerability (Johnson et al 2003; Petersen et al 1997; Heise et al 1999; Ellsberg et al 2000; Campbell et al 2004).

2.5.1 The Pregnancy State as a Risk Factor for Domestic Violence

It is difficult to conclude precisely whether pregnancy itself is a trigger for violence, as data from different social contexts is inconsistent. In three studies on violence during pregnancy from North America, the prevalence was 6.6% of 548 subjects (Stewart & Cecutti 1993), 8.3% of 290 women (Helton et al 1987), and 7.4% of 1243 women (Amaro et al 1990). The rate of violence starting in pregnancy was 13.9%, 12.5% and 88.0% in the studies by Stewart and Cecutti (1993), Helton et al (1987) and Amaro et al (1990) respectively. The respective rates of violence that co-existed before and continued during pregnancy are 86.1%, 87.5% and 12.0%. Violence is also common (and may even increase) in the postpartum period (Stewart 1994; Hedin 2000). Some studies suggest that pregnancy leads to start or escalation of domestic violence (Berenson et al 1991; Stewart & Cecutti 1993). Such studies were not primarily designed to answer that question, and the apparent increased violence in pregnancy (where pregnancy showed and apparent increase in violence rates) is attributed to the relatively young age of pregnant women in these populations (Jasinski & Kantor 2001). In contrast, other studies (Gelles 1988; CDC 1999; Jasinski & Kantor 2001) suggest that domestic violence reduces during pregnancy, as the risk and rates of pregnant and non-pregnant populations do not differ. Likewise, such studies were not primarily designed to answer this research question. A history of domestic violence is a strong and consistent predictor of further domestic violence during pregnancy (Campbell et al 1995; Glander et al 1998; Heise et al 1999).

Whether (and why) the risk, prevalence or vulnerability to domestic violence increases during pregnancy remains unclear. This necessitates designing qualitative studies that could shed light on this issue and associated mechanisms. Ballard et al (1998) suggest that the violence specific to pregnancy should be distinguished from violence that is part of an ongoing pattern, and recommend that 3 patterns be identified, namely:

(1) No violence before pregnancy but violence occurs during pregnancy (starts);
(2) Violence both before and during pregnancy (violence continues);
(3) Violence before but not during pregnancy (violence ceases).
2.6 MATERNAL COMPLICATIONS AND ADVERSE OBSTETRIC OUTCOMES OF DOMESTIC VIOLENCE DURING PREGNANCY

Domestic violence causes adverse reproductive health. Other than direct injury, physical and sexual violence may cause chronic pelvic pain, sexually transmitted infections, depression, stress-related disorders, unintended pregnancies and adverse pregnancy outcomes (Barzellato 1998). Domestic violence during pregnancy has been associated with adverse pregnancy outcome ranging from abortions, preterm labour, low birth weight and premature rupture of membranes (Sammons 1981; Bullock & McFarlane 1989; Pearlman et al 1990; McFarlane 1992; Campbell et al 1999). There is evidence that complications are a result of direct trauma to the abdomen (Goodwin & Breen 1990) and lesions are more frequent and severe in pregnant women (Campbell 1995). In an American study (Goodwin & Breen 1990) of 203 pregnant women with trauma lesions, 31.5% were victims of intentional violence. Domestic violence during pregnancy has been associated with late antenatal care attendance (Dietz et al 1997).

2.6.1 Mechanism for Causation of Adverse Outcomes

The complications may arise directly or indirectly. Directly, a physical or sexual assault involving abdominal trauma can cause abruptio placenta, leading to foetal death, abortion or preterm labour, and thus delivery of a preterm infant (Pearlman et al 1990; Webster et al 1996; Nasir & Hayder 2003). Injury may also result into ruptured viscera (uterus, bladder, spleen, liver and mesentery), fetal fractures or rupture of membranes (Kaye 2000). Indirectly, complications and adverse outcomes may arise from consequences of victimization and isolation. Victimization and resultant stress may exacerbate chronic illnesses such as hypertension, asthma or heart disease, with deleterious effects on the mother and the foetus (Heise et al 1999). It has been suggested that chronic stress could also impair the survivor’s immune system thereby increasing vulnerability to infections (Heise et al 1999).

The indirect pathway focuses on the relationship between the survivors and the victimizer (Heise et al 1999). The latter uses a variety of strategies or methods to coerce and exert control over the woman in the relationship. Such methods may include verbal intimidation, abuse, or denial of freedom (of opinion or movement). Thus victimization may cause psychological or physical stress, isolation and inadequate access to health care, behavioral risks (such as cigarette smoking and alcohol abuse), or inadequate maternal nutrition. All these may compromise maternal and fetal outcomes of pregnancy. Effects of violence possibly add onto pre-existing risk factors such that adverse effects may not manifest in low risk populations (Jagoe et al 2000).

2.6.2 Biomedical Evidence of the Pathogenesis of Adverse Outcomes

There is evidence currently that biomedical or obstetric risk factors predict only a small proportion in the variance of adverse obstetric outcomes (Wadhwa et al 1996). Previous studies that failed to show the link between prenatal psychological stress and adverse outcomes were limited by methodological and conceptual weaknesses in related to definition and measurement of predictor and outcome variables, sampling, research design or analysis of confounding in prediction of these outcomes (Lobel 1994; Paarlberg et al 1995). Prospective studies in humans that addressed these limitations (Homer et al 1990; Pagel et al 1990; Rothberg & Lits 1991; Lobel et al 1992; Lou et al 1992; Collins et al 1993; Hedegaard et al 1993; Wadhwa et al 1993) showed that prenatal psychosocial factors are related to incidence of adverse birth outcomes and that this association is independent of socio-demographic or biomedical risk. In experimental animals, such prenatal stress has similarly been linked to low birth weight, preterm labour and late neurodevelopment abnormality (Insel et al 1992).
2.6.3 The Mechanism for Adverse Effects of Domestic Violence and Stress

The mediating role of psychosocial stress on adverse pregnancy outcomes may be mediated by changes in the neuro-endocrine response (Henry et al 1994). Neuro-endocrine changes of pregnancy are characterized by evolution of a placental endocrine unit which produces (steroid and peptide) hormones, neuropeptides, growth factors and cytokines (Wadhwa et al 1996). Although high levels of Cortisol in pregnancy inhibit corticotrophin-releasing hormone (CRH) in the maternal hypothalamus, they stimulate the CRH gene in the placenta (Wadhwa et al 1996), leading to marked increase in CRH messenger ribonucleic acid (CRH mRNA). This results in increased secretion of placental CRH, adrenal corticotrophic hormone (ACTH) and beta endorphins (Frim et al 1988). Since some of these substances (especially ACTH) are bioactive (Chan & Smith 1992; Waddell & Burton 1993), they enter the maternal circulation where they may stimulate release of Cortisol from the maternal adrenal cortex. Cortisol is responsible for mediating effects of stress and the positive feedback loop that stimulates further synthesis and release of Cortisol, CRH, ACTH and beta endorphins (beta E).

The effects of stress on birth weight and preterm delivery appear to be mediated by increased neuro-endocrine activity of the hypothalamic-pituitary-adrenal axis and the placental-adrenal axis (Wadhwa et al 1993, Wadhwa et al 1996). In the adrenals, there may be increased release of catecholamines into systemic and placental circulation. The resultant vasoconstriction and hypoxia may affect uteroplacental perfusion, thereby leading to intrauterine fetal growth restriction (Cosmi et al 1990; Shepherd et al 1992; Teixeira et al 1999). The stress may also cause maternal immunological or behavioral alterations (Petersen et al 1997; Newberger et al 1992). Domestic violence causes chronic or recurrent stress (Feske et al 2001). Depression and anxiety during pregnancy have been associated with low birth weight (Pagel et al 1990) or pregnancy complications such as pre-eclampsia (Kurki et al 2000). The associated adverse effects may even extend to the offspring, thereby increasing risk of mortality for the infants born to domestic violence survivors (Jejeebhoy 1998; Asling-Monemi et al 2003).
2.7 CONTEXTUALIZATION OF DOMESTIC VIOLENCE

2.7.1 Heise’s ecological framework

Figure 1: Heise’s Ecological Model (Modified)

Analysis of the determinants of D.V.:
Heise’s ecological model framework

Heise (1999) proposed a framework for analyzing the determinants of domestic violence from the interplay of personal, situational and socio-cultural factors. From this model, violence results from the interaction of factors at different levels of the social environment. This model consists of 4 concentric circles. The innermost circle represents the biological and personal history (including socio-demographic history) that an individual enters the relationship with. They include witnessing marital conflict as a child, childhood abuse or neglect, and alcohol or drug abuse. The second circle represents the relationship: the immediate context in which abuse occurs (such as marriage, family). It includes marital conflict, poverty and unemployment and spousal control of decision-making and finances. The third circle represents the formal/informal institutions or structures in which the relationship occurs (community). These include isolation from family or friends, association with delinquent peers, and low socio-economic status. The outermost circle represents the economic and social environment and cultural norms.

In the model, social and cultural norms (such as those that assert men’s superiority over women) combine with individual level factors, family level factors and community level factors to determine the likelihood of violence. The more the risk factors from this model the higher the likelihood of domestic violence. The factors interact in such a way as to increase or limit violence, thereby increasing or reducing women’s risk or vulnerability to violence (Heise 1999). All social groups can be affected as long as unequal power relations exist.

2.7.2 Levinson’s Ethnographic Study on Determinants of Domestic Violence

Levinson (1989) studied 90 pre-industrial societies worldwide on the linkage between domestic violence, patriarchy and the socio-cultural norms. He identified four factors that are consistently related to violence. These are: economic inequality between men and women, use of physical violence for conflict resolution, male authority and decision-making and divorce restrictions. Similar factors are cited by others (Barzellato 1998, Heise 1999). However, in an earlier review of 52 studies for 97 potential correlates of domestic violence
(Hotaling & Sugarman 1986), the only consistent risk marker (consistent in 11 of 15 studies) was witnessing family violence as a child.

2.7.3 Sanctuaries and Sanctions Framework
Counts et al (1999) conceptualized domestic violence using the sanctions and sanctuaries framework. In societies where women’s status is very high or very low, such levels of domestic violence are low, as violence is not needed to enforce male authority. In societies where women’s status is in transition, violence is used to enforce male authority. Where sanctions exist (legal or cultural) or where shelters for battered women exist, domestic violence is low. In contrast, in societies where the above are non-functional or non-existent, domestic violence is common.

2.7.4 Modernization, Changing Power Relations and Domestic Violence:
Silberschmidt (1992), in her research in Kisii District of Kenya, compared the traditional patriarchal society and the modern society, and noted that women presently take on different roles from those which are ascribed to them according to the cultural and social norms of the traditional patriarchal society. She hypothesized that domestic violence may arise from changed power relations following modernization and associated social change. Women’s traditional roles restricted their influence and activities to the home (housework, domestic labour, childbearing and child rearing). This reduced their decision-making, especially on issues outside these spheres. With modernization, women education and socio-economic changes, there is a change in the social order whereby women take on increasing roles in decision-making and carry out activities outside the traditional spheres.

In her research, Silberschmidt (1991) found that men seem to have lost identity with their position weakened and self-respect affected. In contrast, women had gained access to income, employment and resources, unlike in the traditional society. Conflicting values and norms had emerged, with a new code of conduct, as a consequence of women empowerment, both socially and economically. The traditional division of labour in the household had changed. Individuals (of either sex) no longer fitted into the traditional gender norms (socially constructed for each sex) following the change. This caused conflict and gender violence was common. Where society lacks or has weak mechanisms for conflict resolutions, gender violence result as a result of loss of male identity

2.7.5 The Cycle of Violence
White (1989) describes a 3-phase cycle of violence. In this model, the first phase is the tension-building phase. In the phase, the aggressor is irritable, uncommunicative and bad tempered. In the second phase, there is verbal or physical explosion leading to emotional or physical abuse. The last phase (“honey moon” phase) is characterized by the aggressor becoming kind, apologetic and extremely loving.
2.8 COPING MECHANISM IN DOMESTIC VIOLENCE

2.8.1 Coping mechanisms in stress
Stress designates bodily processes created by circumstances that place physical or psychological demands on an individual (Selye 1976). Selye (1976) theorized that non-specifically-caused stressors led to stereotypical responses. The mechanism or processes by which the individual adapts or adopts a different or changed behaviour in response to the stressor is what is referred to as the coping mechanism in this context.

2.8.1.1 Conservation of resources theory of coping with stress
In the conservation of resources theory, Hobfoll et al (1996) theorized that stress occurs in contexts where resources are lost, threatened or invested without gain. The behaviour an individual manifests in coping with stress is that geared at conserving resources.

2.8.1.2 Transaction theory of coping with stress
Lazarus and Folkman (1987), in their transaction theory of coping with stress, described coping as occurring in two ways: 1) Problem-focused (approaching): action-oriented (overt) behaviour aimed at reducing stress. 2) Emotion-focused (dissociating): covert actions whose primary goal is achieving emotional balance. Lazarus (1991) described stress as a relationship (transaction) between individuals and their environment. He described 15 emotions, 9 of which are negative (anger, fright, anxiety, guilt, shame, sadness, envy, jealousy and disgust), 4 are positive (happiness, pride, relief and love) and 2 ambivalent (hope and compassion). Accordingly, coping is classified depending on characteristics of the coping process, which exhibits both behavioral and cognitive reactions organized sequentially into episodes. Individual elements change the person-environment reality or reduce negative emotions. Lazarus (1991) distinguishes eight coping strategies: confrontative coping, distancing, self-controlling, social support-seeking, accepting responsibility, escape-avoidance, planful problem-solving and positive reappraisal. Individuals’ coping behaviour is geared at achieving these strategies.

2.8.1.3 Byrne’s Repression-sensitization theory of coping with stress
According to Byrne’s repression-sensitization bipolar construct (Byrne 1964), individuals located at one pole of this dimension (repressors) tend to deny or minimize the negative consequences of stressors, while individuals located at the opposite pole (sensitizers) react with anxiety.

2.8.1.4 Blunting and monitoring theory of coping with stress
Miller (1987) conceptualized the monitoring and blunting theory, according to which individuals’ responses depend on the attention directed to the stressor. According to this theory, individuals employ avoidant cognitive strategies (distraction or denial) by lowering arousal response, to present with blunting coping behaviour (if the stressor is controllable) or monitoring coping behaviour (if the stressor is uncontrollable).

2.8.1.5 Model of coping modes
In the model of coping modes, Krohne (1993) depicts stress as having two central features. These are ambiguity (uncertainty), which activates vigilant tendencies, and aversive stimulation (emotional arousal), which stimulates avoidant tendency. Confronted with stressors, individuals employ either arousal-motivated or uncertainty-motivated coping behaviour depending on the individual’s susceptibility to stress.
2.8.2  Landenburger’s Coping Theory for Domestic Violence

Landenburger (1989) describes the complex process of coping with violence as occurring in 4 stages. These are the binding stage, the enduring stage, the disengagement stage and recovery. In the binding stage, there is rationalization or denial, with focus on the positive aspects of the relationship. In the enduring stage, there is a shift in perception: women may cover up the violence, blame themselves or modify their behaviour to lessen the situation. In the disengagement stage, there is recognition of the problem and seeking for help. The recovery stage is marked by leaving (the relationship) if violence persists.

The coping process is complex and may stretch over a long period of time or may be vicious cycle. This depends on the emotional or social support available for the survivor, the ability to cope, the perceived severity of the violence or the survivor’s perception of the danger that violence poses. Some women may even oscillate from one stage to the other during the coping process. Survivors use active strategies to maximize their safety and that of family members. Some flee while some persist. The survivors’ responses are conditioned and limited by options available. The factors that may make a woman stay include fear of retribution, lack of economic support, emotional dependence, concern for children; lack of social support or hope that “he will change”.

Reasons why or how women may endure domestic violence in different socio-cultural contexts are not well known. Some of the reasons are financial dependence, less severe abuse, emotional attachment, fear of reprisals, self-blame, concern for children and support from family or friends (Ferraro & Johnson 1983; Hotaling & Sugarman 1986; Strube 1988; Landenburger 1989). Such factors influence the coping mechanism for domestic violence.

2.8.3  Enduring love: a grounded theory of women’s experience of violence.

In this study, Kearney (2001) analyzed the cultural contexts that normalized relationship violence among ethnically and geographically diverse women, with aim of describing a Grounded theory of women’s responses and coping with domestic violence. These women, aged 16-67 years, described a process in which violence was incongruous. They described shifting definitions of their relationship situations, which went through four phases. The initial phase could be described as a situation where initial violence was discounted. With increasing and unpredictable violence, the process moved into a phase of demoralization. This further progressed into a stage where violence was described as unacceptable, to fourth phased where they could no longer endure and moved out of the relationship. Variations in this process were linked to personal, sociopolitical and cultural contexts.
2.9 DOMESTIC VIOLENCE, PREGNANCY INTENTION AND INDUCED ABORTION

2.9.1 The Ugandan Context
From the Uganda Demographic and Health survey (UDHSS 2000/2001), Uganda has low contraceptive prevalence rates of only 23 percent though knowledge of contraception is over 80 percent. Induced abortion, which is an indicator of unwanted pregnancy, contributes 15-30 percent of all maternal deaths. On unplanned fertility, a third of births in 5 years prior were mistimed (wanted later), and 15 percent unwanted. Total fertility rate is 6.9 and the crude birth rate is 47 per 1,000 births. Proxy indicators for unmet need for contraception (for women, men and couples) are unplanned/unwanted pregnancy, high levels of knowledge about contraceptive methods with low use rates, induced abortion and covert contraceptive use by women (UDHS 2000/2001). Domestic violence is common (Blanc et al 1995; UDHS 2000/2001) in both rural and urban areas.

2.9.2 Definition of Pregnancy Intention (and Unintended Pregnancy)
Miller (1974) defined an unintended pregnancy as one which is mistimed or unwanted. Its complement is the pregnancy. Pregnancy intention is often also referred to as intendedness. The concept of intendedness (or unintendedness) is viewed in a qualitatively distinct manner from planned (or unplanned pregnancy) and has more relevance to the decision to keep or terminate a given pregnancy (Fischer et al 1999). The five qualitative dimensions of pregnancy intention (often called pregnancy intendedness) are preconception desire for pregnancy, steps taken to prepare for pregnancy, fertility behaviour and expectations, postconception desire for pregnancy and adaptation to pregnancy and infant (Stanford et al 2000). Covert contraceptive use and non-use of contraception (in women who do not desire to conceive) are therefore proxy indicators of unintended pregnancy if conception occurred. One indicator of lack of fertility control is unintended pregnancy.

Qualitative studies on pregnancy intendedness (or intention) show a strong partner influence on both definition (Fischer et al 1999) and actual pregnancy wantedness (Zabin et al 2000), both preconception and post conception (Stanford et al 2000). Therefore, spouses have a major influence on whether an unintended pregnancy is unwanted and on whether women may decide to keep or terminate such pregnancy (Fischer et al 1999; Zabin et al 2000). Pregnancy intendedness is not fixed in any given pregnancy, but may change in a positive or negative direction with progression of pregnancy (Poole et al 2000).

2.9.3 Domestic Violence and Pregnancy Intention
Domestic violence may be one of the factors that influence pregnancy intention either preconception or post-conception. Domestic violence is common in Uganda, and is associated with low contraceptive use rates (Blanc et al 1996; UDHS 2000/2001). Being excessively controlled, fear, insecurity and lack of decision-making (about contraceptive use) may be reasons why survivors of domestic violence rarely use contraceptives (UDHS 2000/20001). Many methods require either partner permission or compliance before they can be used. The fear of domestic violence may act as a barrier for contraceptive use for women in general. Some women may experience domestic violence as they try to negotiate use of male methods. Others may experience domestic violence if found out to be covertly using contraceptives. Therefore domestic violence may contribute to for low contraceptive use rates (UDHS 2000/2001).

Several studies that have explored the relationship between domestic violence and pregnancy intention indicate that women who report exposure to domestic violence were more likely (than those not exposed to violence) to report that the pregnancy was more closely spaced, unintended or unplanned (Hillard 1985, Amaro et al 1990; Stewart &
Cecutti 1993, Jacoby et al 1999, Kaye 2001b; Pallitto et al 2005). This suggests an influence of abuse on pregnancy intention in such populations (Pallitto et al 2005). Though several researches (Hillard 1985; Amaro et al 1990; Stewart & Cecutti (1993) showed an association between unintended pregnancy and domestic violence, the designs had limitation as they examined bivariate relationships without controlling for contextual factors.

2.9.4 Prevalence of Domestic Violence in Women with Unwanted Pregnancy

Research has shown a strong association between unintended pregnancy and domestic violence. Boyer and Fine (1992) in America found that two-thirds of 535 adolescent women who had unintended pregnancy had been sexually abused in childhood. Campbell et al (1995), in a qualitative study found that relationship abuse was connected to unintended pregnancy through the partners’ control behaviour, and that one means of this control was ensuring that the woman either does not use contraception or conceives. Gazmararian et al (1995), on analyzing pregnancy intendedness and domestic violence in a population-based study of new mothers found that women with unwanted pregnancies had 4.1 times the odds of experiencing physical violence by a spouse or intimate partner during the twelve months prior to delivery compared to women with intended pregnancies.

2.9.5 Prevalence of Unwanted Pregnancy in Women with Pregnancy Termination.

Domestic violence is common among women who seek elective pregnancy termination. In a study among such women in America and using a single screening interview, Evins and Chescheir (1996) identified 31.4 % of 51 women with a life-time history of physical abuse, and 21.6% (with physical abuse) in the preceding calendar year. Glander et al (1998), in their study of 486 women seeking out-patient abortion services and using a self-administered questionnaire, found that 192 (39.5%) reported a history of physical abuse. In this study, relationship issues were the commonest reason for pregnancy termination given by women with history of domestic violence. Leung et al (2002) similarly found a significant relationship between pregnancy termination and domestic violence when women seeking elective pregnancy termination were compared to those admitted for other gynaecological disorders.

The need for more research is strengthened by the argument that pregnancy wantedness (or intention) is not a fixed entity but may vary, for various reasons, in a positive or negative direction (Poole et al 2002). If domestic violence influences pregnancy intention, then it could also influence decision for pregnancy termination and therefore induced abortion. Most induced abortions are of pregnancies that are unintended, though not necessarily unwanted (Torres & Forrest 1988). Research has shown a high prevalence of domestic violence among women seeking postabortion care (Kaye 2001b). Women in abusive relationships are likely to consider pregnancy termination (Hillard 1985; ACOG 1995; Dietz et al 1999, Kaye 2001a). Several studies (Amaro et al 1990; Webster et al 1996; Jansen et al 2003) similarly found a higher prevalence of prior abortions) among women with a history of domestic violence than among women with no such history.
3.0 STATEMENT OF THE PROBLEM

The Uganda Demographic and Health Survey (UDHS) report (2000/2001) which has the latest nationwide reproductive health statistics shows that Uganda has low contraceptive prevalence rates of only 23%. There are many unwanted pregnancy and induced abortion, which is an indicator of unwanted pregnancy, contributes 15%-30% of all maternal deaths. Domestic violence is common in Uganda in women of different socio-economic strata in rural and urban areas (Blanc et al 1995; UDHS 2000/2001). In a hospital-based study of pregnant women, a prevalence of 57 percent from new attendees of antenatal clinic was found (Kaye et al 2002). Domestic violence is also common among breastfeeding women (Kaye- unpublished report 2002), and in women seeking care after abortion (Kaye 2001a; Kaye 2001b). Several UDHS reports (1989, 1995, 2000/2001) have shown high levels of knowledge about contraceptive methods despite low use rates. Domestic violence may contribute to unwanted pregnancy through non-use of contraceptives, consequently contributing to the burden of induced abortion. Such violence and associated gender inequality have a negative impact on HIV prevention efforts (Kaye 2004).

Though domestic violence is common, little was known about the social dynamics and power relations that underlie domestic violence and so constitute the social context in Uganda as well as other sub-Saharan African countries. There was no local data on the linkage between domestic violence, unwanted pregnancy and induced abortion. The studies where pregnancy termination had been linked to domestic violence or pregnancy intention were carried out in countries where termination of pregnancy is legal and abortion laws are not restrictive. In Uganda and most sub-Saharan African countries, abortion is illegal or restricted, and can only be performed in situations where the continuation of pregnancy adversely affects the life of the mother. Therefore such countries provide a different socio-economic and cultural context (studies in Europe, America, Asia or South Africa). Gender relations are culturally-specific. The available literature from Uganda (Blanc et al 1995, UDHS 2000/2001) is either health institution-based or does not cover the social context in which pregnancy-related violence occurs.

A few studies in Uganda (Blanc et al 1995; UDHS 2000/2001) explored women’s and men’s perceptions of domestic violence, but did not highlight the pregnancy context or factors that may increase or reduce risk and vulnerability to domestic violence in pregnancy. Likewise, there was little information on coping strategies for domestic violence in women. Little was known about women’s and men’s perception of domestic violence, especially in pregnancy, and its linkage to reproductive ill-health. No studies have explored the adverse effects of domestic violence in pregnancy on women’s health, especially pregnancy-related effects. Though there was evidence that women in abusive relationships are likely to consider pregnancy termination, the linkage between domestic violence and induced abortion had not been fully explored.

Few researches have been carried out in sub-Saharan Africa, and therefore little is known, about the relationship between domestic violence during pregnancy and biomedical complications such as low birth weight and maternal ill health during pregnancy. Health workers in Uganda have inadequate knowledge about domestic violence (Kaye et al 2005). From the available studies, how much domestic violence contributes to pregnancy complications, antepartum hospitalization or low birth weight is not known. How much of these complications could be attributed to domestic violence was unknown. Therefore, there is little data on public health impact and benefits of eliminating domestic violence during pregnancy.
4.0 STUDY JUSTIFICATION

In Uganda, over 80% of pregnant women attend antenatal care in health facilities at least once. It is mainly during pregnancy that healthy women come into frequent contact with health workers. Thus pregnancy offers a unique opportunity to screen for and assist survivors of domestic violence. For a problem that is reported to have adverse neonatal and maternal complications, domestic violence is under-reported and under-researched, especially in Africa. Physical abuse in pregnancy is now well recognized as a significant preventable public health problem, with risk to the health of both the mother and the unborn baby. Such abuse has direct effects resulting from physical trauma, and indirect effects through prenatal psychological or psychosocial stress affecting maternal neuroendocrine responses or health-seeking behavior of the survivors. Denial of food, treatment or movement by the spouse may indirectly affect health of the pregnant woman even if it is not associated with physical abuse. Domestic violence during pregnancy has adverse effects on the health of the survivor, the unborn baby up to infancy. Early identification of and care for survivors might reduce adverse outcomes of violence in high risk situations, such as pregnancy.

Justification of the methodological approach used

Modern public health has shifted to a broader scope that involves evaluation of people’s experience of disease and environmental or biomedical factors that influence health. (Dahlgren et al 2004). This is a result of increasing patient/client expectations and diversity of health services provided, which, in order to meet expectations, requires research on a wider range of potential research questions (Pope & Mays 1995). Consequently, research and interventions involve use of paradigms and methodologies that involve interdisciplinary collaboration in which quantitative and qualitative research methodologies are complementary (Morse 1991; Baum 1995; Dahlgren et al 2004).

In this thesis, qualitative research methods were used to describe the phenomenon of domestic violence, while quantitative methods were used to test hypotheses. This is the justification for combining qualitative and quantitative methodologies. Some of the hypotheses generated in the qualitative inquiry were tested in the quantitative studies:
1. To relate domestic violence during pregnancy, unwanted pregnancy and induced abortion;
2. To relate domestic violence during pregnancy and adverse pregnancy outcomes.

Qualitative research is based on methodological traditions (Creswell 1998) which enable deeper understanding of social phenomena or events in natural settings, with emphasis on experiences, meanings, interpretations and views of participants (Pope & Mays 1995). While quantitative research typically starts a hypothesis from existing theory (that is tested against reality using deductive reasoning), qualitative research begins with reality whereby hypotheses or theories are discovered through inductive reasoning (Dahlgren et al 2004). The two methodologies (qualitative and quantitative) complement each other, such that hypotheses generated may be tested against data, thus oscillating between theory and data, a method called the abductive method (Dahlgren et al 2004).

There are three ways in which combining methodologies may be achieved (Varkeisser et al 1991; Morse 1991; Dahlgren et al 2004):
1. Qualitative research may explore complex phenomena that are not amenable to quantitative research, for instance exploring whether and why variations in a phenomenon exist in a given population (Pope & Mays 1995).
2. Qualitative research may precede quantitative research as an essential preliminary.
3. Qualitative research may be used to supplement quantitative research (as a form of validation through triangulation of methods).
5.0 RESEARCH QUESTIONS
1. How common is domestic violence during pregnancy and what factors are associated with it?
2. What are women’s and men’s perspectives regarding domestic violence? Do they recognize the linkage between violence and reproductive ill health?
3. What factors increase or reduce women’s risk (or vulnerability) to domestic violence during pregnancy? What are the survivors’ coping strategies?
4. Are survivors of domestic violence during pregnancy more likely to experience maternal complications (leading to hospitalization) or perinatal complications (such as low birth weight)?
5. Does domestic violence contribute to unwanted pregnancy or induced abortion for the women who seek postabortion care?

6.0 OBJECTIVES
6.1 GENERAL OBJECTIVE
To explore the social context and biomedical consequences of domestic violence during pregnancy in Uganda.

6.2 SPECIFIC OBJECTIVES
1. To assess the prevalence and factors associated with domestic violence during pregnancy among women attending antenatal clinic in Mulago hospital, Uganda
2. To explore the social dynamics and gender power relations that underlie violence in pregnancy through exploring the perceptions, attitudes and experiences of men and women about violence in pregnancy, linkage of domestic violence and reproductive ill health, and coping strategies of domestic violence survivors.
3. To compare the rates of domestic violence between women with induced abortion and those with non-induced (spontaneous) abortion
4. To compare maternal complications and resulting hospitalization among women with and those without history of domestic violence during the current pregnancy
5. To compare foetal complications (low birth weight) among women with and those without history of domestic violence during the current pregnancy
7.0 METHODS
7.1 RISK FACTORS, NATURE AND SEVERITY OF DOMESTIC VIOLENCE IN PREGNANCY (OBJECTIVE 1, PAPER I)

The study was conducted in New Mulago hospital, the largest public hospital and national referral hospital in Kampala, the capital of Uganda. The objectives were to determine the prevalence, types, severity and associated risk factors for domestic violence among women attending antenatal clinic in Mulago hospital. Study subjects were women attending antenatal clinic, on their first antenatal visit, who were selected by systematic sampling (one in 10 new attendees) between 15th January and April 30th 2000. A questionnaire was administered to these women by two midwives and the principal investigator. The prevalence of domestic violence was assessed using the six Questions from the Abuse Assessment Screen (McFarlane et al 1992). Those who replied affirmatively to the questions referring to the three domains (physical, sexual or psychological abuse) were registered as having history of domestic violence. The severity of domestic violence was assessed using the Severity of Violence against Women Scale. The questionnaires entered into the Statistical Package for Social Sciences (SPSS, version 4.0) programme for analysis. Using chi-square test for categorical variables and student t-test for numerical variables at the 95% confidence level, participants’ risk factors for domestic violence were assessed from socio-demographic characteristics, reproductive history, domicile and behavioral/lifestyle factors (such as smoking or drinking).

7.2 THE SOCIAL CONTEXT AND CONSTRUCTION OF DOMESTIC VIOLENCE (OBJECTIVE 2, PAPERS II AND III)

7.2.1 Study Setting
An exploratory qualitative study was carried out in Wakiso District, Uganda. This district surrounds the capital city, Kampala, and is unique in that it has areas with markedly different areas of socio-economic development, ranging from peri-urban areas (bordering the city) to typically rural areas. It is heterogeneous, the population being made of people of varied ethnicity (UDHS 2000/2001). Most of the people understand or speak Luganda, a local Bantu language dialect of the Baganda, the indigenous tribe of the region. The smallest administrative unit in Wakiso district, the Local Council I, has nine positions of which one is reserved for women to handle family and gender issues. This is the first place where domestic violence cases are likely to be reported. Wakiso district has 8 health sub-districts, which include Wakiso and Kasangati as the largest units. Health workers from these health units run out-reach services in the community, and are therefore likely to come into contact with cases of domestic violence. The study setting was two parishes in two sub-counties (Wakiso and Kasangati): one peri-urban and one typically rural.

7.2.2 Focus group discussions (FGDs)
The study involved 14 FGDs of 6-10 people per group, with men and women separately: initially 4 for men (2 for those aged 18-30 and 2 for those 30-40 years) and 4 for women (2 for those aged 20-30 and 2 for those above 30 years); and later 6 FGDs for exploring bride price and reproductive health. The participants were identified by the first author and three research assistants, and were purposively selected in order to provide a diversity of ages, and socio-economic background, and subsequently diverse views and opinions.

7.2.3 Key-informant interviews (KIIs)
From suggestions and views that emerged from the FGDs, 12 men and women were purposefully selected for KIIs. These represent ‘gate keepers’ (people socially respected and identified by the communities as key sources of information or support for domestic violence survivors). They included civic leaders, women leaders on the local councils,
members of FIDA (Association of Women Lawyers), religious leaders and health workers of either sex. Interviews focused on the interviewee’s perceptions of what actions constitute violence, associated factors and resources available for survivors.

7.2.4 Case-vignettes
From views expressed in KII s and FGDs, four case-vignettes for (either sex, representing the younger and older age-groups) were arranged comprising of 8-12 participants. The case history revolved around a story (plot) of a pregnant woman and what may happen to her after distinct episodes or situations. Ill health, gender roles, pregnancy changes, dietary preferences and employment (which were suggested in the interviews and FGDs conducted prior) were explored as part of the plot.

7.2.5 Data analysis
The interviews were carried out in English or Luganda, while all the FGDs and case vignettes were conducted in Luganda, (by the first author with assistance of two research assistants), before back translation into English. Field notes taken were used to ascribe quotations of statements, and proceedings were tape recorded. Data analysis involved development of codes and categories according to key concepts and issues (meaning units) from the transcripts and field notes. Systematic comparison of emerging codes and categories across texts was done, by thematic content analysis, using Easy Text (EZ Text) software.

7.3 COPING STRATEGIES FOR PREGNANT ADOLESCENT DOMESTIC VIOLENCE SURVIVORS IN MULAGO HOSPITAL, UGANDA (OBJECTIVE 2, PAPER IV)
Adolescent behaviour is influenced by prior experiences and socialization. Why domestic violence survivors develop adverse outcomes is unclear, but may depend on how they cope with the stress of violence and the resultant behaviour that they manifest. The objective was to explore pregnant adolescents’ experiences of domestic violence and to describe adopted coping strategies. This was a qualitative study involving 16 in-depth interviews with pregnant adolescent domestic violence survivors attending the antenatal clinic in Mulago hospital, Kampala, Uganda, from January through May 2004. Theoretical sampling (necessitated by the emergent theory from sequential data collection and analysis) was used. Data was analyzed using Grounded theory.

7.4 DOMESTIC VIOLENCE, UNWANTED PREGNANCY AND INDUCED ABORTION (OBJECTIVE 3, PAPER V)
The objective was to compare pregnancy intention and domestic violence among women with induced and spontaneous abortion. A case-control study was conducted in Mulago hospital, Uganda, from September 2003 through June 2004. Subjects were 942 women seeking postabortion care. Direct inquiry, records review and clinical examination identified 333 with induced abortion (cases) and 609 with spontaneous abortion (controls), who were compared regarding socio-demographic characteristics, contraceptive use, domicile (rural or urban, nuclear or extended families), pregnancy intention, household decision-making and domestic violence. Data was analyzed with EPI-INFO and STATA. Stratified and multivariate logistic regression analyses were used to test for interaction and adjust for confounding at the 95% confidence level in assessing predictors of induced abortion. The reasons, methods and decision-making process for pregnancy termination were compared for adolescents and adult women.
7.5 LOW BIRTH WEIGHT AND MATERNAL COMPLICATIONS OF DOMESTIC VIOLENCE DURING PREGNANCY (OBJECTIVES 4 AND 5; PAPER VI)

The objective was to investigate whether domestic violence during pregnancy is associated with maternal obstetric complications and low birth weight delivery. A prospective concurrent cohort study was conducted in Mulago hospital antenatal clinic and labour ward from May 2004 through July 2005. Participants were 612 women recruited in the second trimester and followed up to delivery. The exposure -history of domestic violence (physical, sexual or psychological) during the current pregnancy-was assessed with the Abuse Assessment Screen and the Severity of Violence Against Women scale.

The data was analyzed using STATA version 8 and the Statistical Package for Social Sciences (SPSS version 10). The participants were compared according to baseline characteristics (socio-demographic characteristics, pregnancy intention and reproductive history). For continuous variables, the Student t-test was used, while for categorical variables, the Chi-square test was used, at the 5% significance level. The participants were then compared for the primary outcomes (low birth weight and antepartum hospitalization for maternal pregnancy complications) whose relative risk and attributable risk were computed. Multivariate analysis (Multiple linear regression and logistic regression) were used to adjust for confounding and interaction. Relative risk and attributable risk of LBW and antepartum hospitalization were calculated.
8.0 CONCEPTUAL FRAMEWORK FOR THIS THESIS

Violence is predetermined by gender power imbalances, which result from what the community perceives as acceptable gender norms. Unequal power relations contribute to social dynamics that enhance lack of women empowerment or decision making. This creates a stressful environment as the woman tries to exert control. Failure of peaceful ways for conflict resolution (in a situation of unequal power relations) leads to domestic violence. The latter has adverse implications for sexual and reproductive health.

The physical or emotional trauma involved may directly or indirectly lead to maternal or fetal complications. Stress induced by violence may exacerbate chronic illness in the victim and thus indirectly lead to fetal or maternal complications denial of health care or non-seeking of health care in abusive relationships may eventually compromise maternal or fetal outcome. Thus survivors constitute a high-risk population with high risk of maternal obstetric complications, antepartum hospitalization and low birth weight.

Domestic violence may involve sexual coercion and control behaviour. The latter involve restriction of use of contraceptive services, to the extent that there is either non-use or clandestine use of contraceptives. The latter is associated with higher rates of discontinuation or failure through improper use. The violence compromises the quality of life of the survivor. Unintended (mistimed or unwanted pregnancies) may occur. Unplanned pregnancies may be wanted or unwanted, but the pregnancy wantedness changes with the conditions in the relationship. Where the pregnancy is unwanted, the survivors may seek elective pregnancy termination using a variety of methods. Where abortion laws are restrictive, domestic violence contributes to unsafe abortion with attendant complications.

8.1 Triangulation of Research Methodologies

This thesis exemplified triangulation of qualitative and quantitative research methods in answering different research questions. Triangulation refers to a deliberate approach of collecting, analyzing or interpreting data using a wide range of independent means (Morse 1991; Pope & Mays 1995). According to Knafl & Breitmayer (1989), the role of triangulation is to collect data which is as complete as possible and therefore generalizable. Use of multiple theories, methods, methodologies, data sources or personnel increases the investigator’s depth, breadth and understanding of the research problem (Felding & Felding 1986) so that there is completeness of data, not merely convergence (Felding & Felding 1986). The different methods address the varying dimensions of the research question. The research methodologies (quantitative or qualitative) are merely tools or instruments to facilitate understanding of a research problem, and researchers should be prepared to employ a balanced and extensive repertoire of methods at their disposal (Morse 1991). The qualitative research methods may develop hypotheses, identify subjects or variables, explain, illuminate or expand quantitative data and deepen our understanding of trends. The quantitative studies may measure the magnitude of the problem or trends or test generated hypotheses. Thus the qualitative and quantitative methods are complementary.

Papers II, III and IV involved qualitative research methodologies, in which FGDs, interviews (both in-depth and key-informant) and case vignettes were used. Papers I, V and VI involved quantitative methods: cross-sectional study for Paper I, Case-control study among women seeking postabortion care in Paper V and a prospective cohort study of women in the antenatal clinic for Paper VI.
Table 1. Summary of Methods, Study Designs and Outcomes this Thesis

<table>
<thead>
<tr>
<th>Paper</th>
<th>Study design</th>
<th>Population</th>
<th>Data analysis</th>
<th>Outcomes</th>
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<tr>
<td>I</td>
<td>Cross-sectional study</td>
<td>379 Women attending ANC in Mulago hospital on index visit in March-August 2000</td>
<td>SPSS used, Abuse Assessment Screen tool and Severity of Violence against Women scale used</td>
<td>Prevalence and types of domestic violence during pregnancy (DV); Severity and risk factors for DV</td>
</tr>
<tr>
<td>II</td>
<td>Qualitative research, In-depth interviews, FGDs and case vignettes</td>
<td>Men and women in Wakiso district, civic leaders, health workers and others. Maximum variation sampling used</td>
<td>Thematic content analysis</td>
<td>Perceptions, meanings and interpretation of factors related to DV; Experiences and triggering events.</td>
</tr>
<tr>
<td>III</td>
<td>Qualitative research, In-depth interviews, FGDs</td>
<td>Men and women in Wakiso district, civic leaders, health workers and others</td>
<td>Thematic content analysis</td>
<td>Perceptions and meanings of bride price and its RH implications.</td>
</tr>
<tr>
<td>IV</td>
<td>Qualitative research, In-depth interviews,</td>
<td>16 pregnant adolescent DV survivors from ANC clinic in Mulago Hosp. Theoretical sampling used to select participants</td>
<td>Grounded theory</td>
<td>Experiences of DV; Coping Strategies for DV; Model of coping for pregnant adolescents</td>
</tr>
<tr>
<td>V</td>
<td>Case-control study</td>
<td>942 women seeking PAC in Mulago hosp.</td>
<td>EPIINFO and STATA used. Questionnaire validated (Cronbach’s $\alpha$) and and inter-rater agreement assessed (Kappa statistic) determined. Stratified analysis and multivariate logistic regression</td>
<td>Association between DV and pregnancy intention or induced abortion</td>
</tr>
<tr>
<td>VI</td>
<td>Prospective cohort</td>
<td>612 women attending ANC, followed up to delivery</td>
<td>SPSS and STATA used. Multivariate Poisson and logistic regression and General Linear Modeling</td>
<td>Relative risk, attributable risk and predictors of LBW and antepartum hospitalization for obstetric complications</td>
</tr>
</tbody>
</table>

Key: ANC Antenatal Clinic; DV Domestic violence; FGD Focus Group Discussions; LBW Low birth weight; PAC Post abortion care; SPSS Statistical Package for Social Sciences; RH Reproductive Health
9.0 ETHICAL CONSIDERATIONS

Social research is a dynamic process based on mutual trust and cooperation as well as well-accepted conventions and expectations (Sarantakos 1998, pp20), necessitating that ethical standards are followed during the research (Sarantakos 1998; pp 22-24). From the principle of beneficence, there is an obligation to gain knowledge to eventually reduce the harm of domestic violence. This beneficence is maximized by high quality of the study, increasing benefits to study participants and balancing the demands of the research against wishes of the study participants (Swanberg 2004). From the principle of nonmaleficence, the researcher is obliged to protect participants from risk of anxiety, distress or suffering that may result from participation (Swanberg 2004). Participation may lead to recollection of negative or painful experiences, or may result in real or perceived threat of more violence from the abusive partner (Ellsberg & Heise 2002). In general, participants find the questions on domestic violence acceptable (Stenson et al 2001), even though some may develop more distress (during the interview) than they could anticipate at the time of giving informed consent (Newman et al 1999).

The researchers’ freedom may have adverse effects on participants or their community in general (Ellsberg et al 2001). Therefore, benefits of the research have to be weighed against the potentially harmful outcomes of participation. Ethical standards must be followed during the research (Sarantakos 1998, pp 22-24; Ellsberg & Heise 2002). The World Health Organization recommends ethical guidelines for domestic violence research (WHO 1999; Garcia-Moreno et al 2001), which were followed during the study. These guidelines, which embrace the principle of beneficence, nonmaleficence, justice and autonomy (Beauchamp & Childress 2001; Ellsberg et al 2001) include:

1. Accuracy in data gathering and data processing
2. Relevant research methodology that may answer the research questions
3. Appropriate interpretation of data
4. Accurate reporting with details of data collection and analysis, limitations and problems encountered during the research process
5. Free and informed consent by competent participants who understand the research, with voluntary participation in the research without pressure, deceit or coercion
6. Welfare of the respondent- with minimization of harm, discomfort, embarrassment or guilt and maximization of safety of the respondents
7. Protection of respondents’ rights to privacy, confidentiality and anonymity

Permission to carry out the study was obtained from the following: The Department of Obstetrics and Gynaecology, Makerere University, The Mulago hospital Ethics and research committee, The Faculty of Medicine Higher Degrees Research Committee, The Uganda National Council of Science and Technology, Karolinska Institutet Ethics Committee. Informed consent was obtained from the participants in the study, (individual and community informed consent for participants in the qualitative studies) and individual informed consent for the quantitative studies. Special permission was sought from the above ethical committees to study adolescents, most of whom are minors and therefore ordinarily would not give consent for participation. All study participants with history of domestic violence were offered counseling.

10.0 QUALITY CONTROL

The Research project was carried out with the help of research assistants who were pre-trained before starting the study. Pilot studies were carried out to pre-test the study instruments. All data analyses were performed in collaboration with the co-authors. The qualitative data was tape-recorded during collection and was analyzed using computer software for data retrieval, also with assistance from a social scientist knowledgeable in analysis of qualitative research. The quantitative data was analyzed with assistance of a biostatistician.
11.0 RESEARCH FINDINGS
11.1 QUALITATIVE RESEARCH
11.1.1 The Social Construction and Context of Domestic Violence in Wakiso District, Uganda (Paper II)

The study design and data analysis

This paper describes the experiences and perception of men and women in Wakiso district regarding a phenomenon (domestic violence especially during pregnancy). In the study, focus group discussions, in-depth interviews and case vignettes were employed to collect data from a variety of participants. Thus there was triangulation in data sources (different participants), setting (rural versus urban), research questions (experiences, perceptions, meanings and interpretations), data collection methods (multiple methods and maximum variation sampling) and data analysis. During data analysis in which thematic content analysis was used, the data (field notes and transcripts) were examined for descriptions, patterns and inter-relationships. These formed the meaning units. The justification for triangulation was that in order to understand ‘truth,’ we need to know not only facts but the human experience of them. Qualitative research is concerned with meaning: how people interpret their experience and how they use this experience to guide the way they live (MacQueen 2002).

Four cognitive processes for data analysis (Morse & Field 1996), namely comprehending, synthesizing, theorizing and recontextualizing were employed in this thesis. Thematic content analysis (Burnard 1991; Graneheim & Lundman 2004) was used in Paper II and III. In these papers, the field notes and transcripts were read several times to understand the concepts (comprehending). These constituted the meaning units. As described by Miles and Huberman (1994), some of these codes were descriptive, interpretative or explanatory. The codes were merged into categories according to the theme through systematic comparison of these concepts across the text (indexing and synthesizing) to develop themes. The meaning attached to these categories was determined (theorizing). The findings were discussed in line of existing theories by Heise (1999), Counts et al (1999) and Silberschmidt et al (1991 and 1992) thus recontextualizing.

The study findings

Factors associated with domestic violence (Kaye et al 2005) include uncertainty from changing gender power relations, lack of protection from social and cultural institutions, and social and family networks which often were used to perpetuate violence. Failed negotiation of sexual relations, misconceptions of hormonal and related changes in the pregnant woman, and issues related to gender division of labour, were perceived by men and women to be associated with domestic violence during pregnancy. Domestic violence indicates unequal gender power relations in a changing social environment. This is compounded by misconceptions of pregnancy-related changes during pregnancy. The socio-cultural and economic context of the study setting is characterized by low but rising women’s status, poor legal or social support systems, changing cultural values and male unemployment. Increasing participation of women in wage work creates uncertainty and insecurity for men, as this challenges their traditional roles as breadwinners and main decision makers.

The explanation for domestic violence is that some men felt alienated and confused by women’s increasing independence and autonomy, and related changing gender roles. Such men viewed efforts aimed at empowering women with suspicion and mistrust as they challenge male authority and power. For some male assailants, fear, uncertainty and anxiety were the main driving force. The study findings show that some participants expressed a fatalistic attitude, which may lead to justification of violence and lead to its perpetuation.
Others expressed a militant attitude, which in situations of poor conflict resolution is a recipe for violence. Another finding was widespread ignorance of physiological and behavioral changes that take place in women during pregnancy.

**Discussion of the study findings**

The qualitative approach used in exploring, developing, understanding and explaining theory, as used here, is inductive (Morse and Field 1996). Fear of abandonment, losing control or appearing weak (Eliasson 2001) is a common reason male assailants give to explain domestic violence. Fear and insecurity are a source of vulnerability, and low self-esteem compounds this insecurity. Violence is a form of reaction to perceived powerlessness, desperation and anger, all of which worsen the insecurity and vulnerability (Eliasson 2001). The need to reassert control is founded in men’s low self esteem, lack of communication, fear of losing authority or fear being abandoned (Silberschmidt 1992).

Partners perceive each other as the source of the conflict, either being disobedient, ungrateful or having unreasonable demands (Eliasson 2001). In such circumstances, the spouses or partners are viewed as incapable or unwilling to change or respond. This creates conflict among spouses related to expected gender roles and division of labour. Reasonable criticism is perceived as unjustified, and due to fear of open conflict, those involved let tensions build up inside until something triggers the pent-up emotions (Eliasson 2001). If the initial misunderstanding is not sorted out, fear, suspicion, insecurity and vulnerability increase (Eliasson 2001). These emotions may eventually explode into violence.

The study findings also indicate that uncertainty and gender antagonism, in a situation of unequal power relations, perpetuates the gender power imbalance and contributes to violence during pregnancy (Kaye 2006). They also show that domestic violence is a social problem whose determinants extend from individual or personal characteristics through family, community and societal level factors. This is in agreement with Silberschmidt (1991, 1992) and Heise (Heise 1999) regarding the social context of violence.

The analysis of the social construction of violence is also in agreement with the Cooperative Conflicts Framework (Sen 1993). This framework recognizes, firstly, separate gender interests in relation to power, control and access to resources. Secondly, individuals have competing interests in their quest for power and authority. Thirdly, women use a variety of ‘currencies’ to bargain in situations of inequality. Seeking paid employment, setting up income-generating activities and contraception (even if clandestinely) are some of the ‘bargaining strategies’ employed by women in the study setting. Thus covertly or overtly, some women may strive to overcome gender inequality. In improving women’s access and control over resources, these ‘currencies’ may lead to insecurity and perception of powerlessness in the spouses, thereby increasing risk of domestic violence (Kaye 2006). This argument is supported by the findings from Bangladesh, that in societies where women’s status was increasing, domestic violence increased (Schuler et al 1996; Koenig et al 2003). Women who benefited from credit institutions and participated in income-generating activities, who apparently have higher status and more financial autonomy, were subjected to more violence than the women not involved in such activities.

The risk of further violence increases if the man does not perceive any risk (no legal or social consequences) as a result of initial violence. Likewise, absence of strong social support institutions to assist survivors leads them to accept or tolerate the violence. This applies in situations where the legal system is weak or cultural prejudices against women exist and permeates through the context and social construction of violence. It is a
component of what triggers or influences coping with violence. This finding is in agreement with the Sanctions and Sanctuaries model (Counts et al 1999). The findings of the study also indicate that both men and women realize the potential risk factors for domestic violence, even during pregnancy. Both men and women ‘regret’ the circumstances that trigger off violence. The men expressed guilt feelings about the violence, and expressed desire for change (ending the violence). For some men violence is an expression of powerlessness and need to reassert power and control in situations of insecurity (Eliasson 2001). This is an indication of despair, fear and lack of self-esteem. The findings are therefore in agreement with Silberschmidt (1991 and 1992). When men perceive that they do not live up to pre-conceived notions of success, their identity and self esteem is affected, and violence is a safety valve for frustration to redeem self esteem. Eliasson (2001) refers to this situation as using physical superiority to compensate for emotional inferiority.

### 11.1.2 Implications of Bride Price for Domestic Violence and Reproductive Health In Wakiso District, Uganda (Paper III)

**The design**

In this study, the perspectives of men and women regarding domestic violence and bride price were explored. The particular dimension of the phenomenon described here, bride price, was one of the themes that emerged from the data analysis of perceived factors associated with domestic violence. Consequently, four more focus group discussions and six in-depth interviews were conducted to explore bride price payment and its perceived implications for domestic violence. This methodological design is justified by realization that the context of a phenomenon (bride price context) is part of the phenomenon (domestic violence) itself (Hinds et al 1992). The data was analyzed by Thematic content analysis.

**Main study findings**

Participants perceived bride price as indicating that a woman was ‘bought’ into the man’s household, which reduced her household decision-making roles. Bride price limited women’s independence and perpetuated unequal gender power relations, especially regarding health-seeking behaviour. The study findings indicate that respondents perceived a strong connection between bride price payment and domestic violence. Secondly, bride price payment was perceived to worsen existing gender inequalities and inequities, especially regarding reproductive health decision-making. It also influenced what gender roles were considered appropriate. Where bride price payment reduces the status and prestige of the woman, the perception that the woman was paid for, belongs to the man and has less household decision-making power is manifestation, basis or consequence of gender inequality.

**Discussion of the study findings**

Domestic violence in this context is partly explained by the changing gender power relations as a result of modernization. As a result of changing cultural values, men and women may have different perceptions of appropriate gender roles. Gender relations are sustained through gendered demonstrations and gendered behaviors (Courtenay 2000). Thus men ensure that they establish and maintain some form of control over their spouses, and have anxiety related to failure to monitor the spouses’ sexuality (Chikovore et al 2002). This is an indication of a kind of identity crisis for men that has been described in several areas and related context in sub-Saharan Africa (Courtenay 2000, Silberschmidt 2001, Chikovore et al 2002).

The findings are in agreement with the Sanctions and Sanctuaries model (Counts et al 1999). Bride price payment in the research context is a form of culturally-sanctioned control.
Similar factors were significantly associated with domestic violence in a South African study of risk factors for domestic violence (Jewkes et al 2002). Where repayment of bride price is demanded before separation, bride price payment creates divorce restrictions. Fear of stigma, social vulnerability and lack of financial independence may keep women in such relationships. In the study setting and context, legal or social mechanisms for conflict resolution or getting justice are absent, unfair or weak. This perpetuates gender inequality, gender conflict and domestic violence. The difference in the young and older participants’ views is an indication that the social context of the relationships of young people differs from that of the older generation (Caldwell et al 1998), with decline in traditional values and cultural influences on relationships and behaviour (Kinsman et al 2000). From the cultural context, domestic violence appeared to be justifiable, defensible or even permissible in situations where bride price was paid. Bride price as a contextual factor is in agreement with Heise’s ecological framework of factors associated with domestic violence (Heise 1999).

11.1.3 Escaping the Triple Trap: Coping Strategies Of Pregnant Adolescent Survivors In Mulago Hospital, Uganda (Paper IV)

The study design

The study involved in-depth interviews with 16 pregnant adolescents who reported history of domestic violence. Issues explored were their experiences of violence and the strategies employed in coping with violence. Theoretical sampling of pregnant adolescent survivors (according to the emergent theory) as well as sampling of extreme cases (to test the emerging theory) was employed. The four cognitive processes for data analysis, namely comprehending, synthesizing, theorizing and recontextualizing (Morse & Field 1996) were employed during data analysis using Grounded theory. During analysis, concepts related to coping were identified from systematically exploring interview transcripts and field notes (comprehending through open coding). The concepts were merged into related categories by selective coding (synthesizing) and the different dimensions of the major categories were analyzed to generate a model for coping strategies (theorizing). This model was then discussed bearing in mind changes taking place in the pregnant adolescents due to the three stressors (recontextualizing), namely violence, pregnancy and adolescence.

Main study findings

This study describes experiences of domestic violence by pregnant adolescents and behavioral modifications adopted by pregnant adolescent survivors. The coping strategies employed were analyzed as:

1 Minimizing damage-decreasing impact and severity of violence.

The goal of this strategy was to reduce the negative impact or intensity of violence. The adopted behaviour included placating behavior, keeping silent, distraction, feigning sickness or self-protection (used alone or in combination). Placating behavior was used to prevent arguments, stop fights or reduce stress (after or before violence). Keeping silent was reported by several respondents who described it as “keeping quiet”, “refusing to talk”, “avoiding answering back”, “not talking to him.” Two quotations from respondents exemplify this strategy:

1 “I was very worried about my safety and that of my baby. I had nobody to protect me or help me. So I had to do everything possible to avoid being assaulted. If this meant apologizing immediately, even when he was the one in the wrong, I would do it.” (Primigravida)

2 “Before I got pregnant, I would hit back if he assaulted me. I felt that pregnancy made me weaker, and so avoided any fights, or doing anything to provoke him. So I became quieter as I didn’t want to say anything to annoy him.” (Prime gravida).
The main motivation for described behaviour was worry about the women’s safety or safety of the unborn baby. Therefore, pregnancy was a key influence for this behaviour.

2 Withdrawal
- physical or social withdrawal

3 Seeking help
This involved reaching out to neighbors, health workers, family members, friends, local council (civic) leaders and religious leaders. These could intervene by reprimanding the assailant. This is exemplified by one respondent:

“I reported him to the Local Council chairman. Initially, they just rebuked him. Later he was given a fine- some money and local brew. Things went on well for just a few days and the beating started again.

4 Retaliation (fighting back)
This strategy involved both physical fighting and preoccupation with fighting back or some form of revenge. Such impulsive behaviour is typical of the stage of adolescence, and demonstrates optimistic (emotion-focused) coping with the stressor.

Discussion of the study findings
From the coping mechanisms, some adolescents used problem-focused approaches while others used emotion-focused approaches. Problem-focused approaches indicate action-oriented overt behaviour, whereby the individual does something to relieve the stress (Barnyard & Graham-Berman 1993). In contrast, emotion-focused strategies are covert with primary goal of restraining emotions arising out of the situation or to maintain emotional balance (Barnyard & Graham-Berman 1993). These approaches were markedly influenced by the fact that the adolescents were pregnant.

Regarding coping styles for adolescence, Myors et al (2001) found that most adolescents exhibited the optimistic (emotion-focused) style rather than the problem-focused style. Likewise, Huizink et al (2002) found that emotion-focused and problem-focused styles were simultaneously used for coping with pregnancy. Thus coping processes for domestic violence were influenced by pregnancy and adolescence. Pregnancy appears to influence adaptations for coping with violence among adolescents and vice versa. Since pregnancy is a stressful event (Geller et al 2004) more so in adolescents, and adolescence as a stage of life is a known stressor, adolescents’ behavior manifested coping with violence, adolescence and pregnancy. The pregnancy state appeared to be the main determinant of the coping process.

There are several explanations why pregnant adolescents manifest different coping behavior. Though pregnancy is a stressful event (Geller et al 2004), individuals may differ in the extent to which they perceive or adapt to stress. Pregnancy affects appraisal of negative or stressful events, such that events that occur in early pregnancy may be deemed more or less stressful than if similar events occurred in later pregnancy (Glynn et al 2004). Maternal responses to a stressor depend not only on the nature of the stressor but also upon the time (gestation age) when it occurs and the perceived risk related to it (Glynn et al 2004). Emotional response changes as pregnancy advances, due to neuroendocrine changes (Chrousos et al 1998, Glynn et al 2004). The gestation age at which violence occurs, the severity or nature of the domestic violence, adolescents’ prior experiences regarding violence, the available resources (in terms of social or emotional support) and adolescents’ emotional growth (level of maturity) may explain the different manifestations during coping.

It is probable that pregnant adolescents make logical and rational decisions despite their situations. Consequently, the manifest behavior is a combination of coping mechanisms for the 3 main stressors operating at the time, namely adolescence, pregnancy and violence. Hesitation in decision-making reflects poor problem-solving typical of adolescents and indicates problems in making strategic decisions (Ross 2005). Even in absence of pregnancy
or violence, adolescents lack life skills that facilitate negotiation or decision-making. The choice of coping strategy depends on earlier experience, access to resources and on conception of self and environment (Barnyard & Graham-Berman 1993).

**Implications of the study findings**

1. Strategies employed by participants (which are a mixture of coping with violence, adolescence and pregnancy) varied in contributing to safety. While some are reasonable and helpful, others appear risky and counterproductive. Strategies have social costs like isolation or (likely) incarceration for survivors (or spouses), worsening stress and leading to loss of social or emotional support (from peers, family members or healthcare providers). This may create a vicious cycle of further stress and risk of prolonged violence, with added risk to the health of the mother and the child/children.

2. Coping processes to prenatal stress influence healthcare decision-making and healthcare seeking and subsequent mothering behaviour (such as breastfeeding) (Green & Murray 1994). They affect child well being (Louma et al 2001) or may induce disturbances in behavior, physiology and biochemistry of the offspring (Field 1998).

3. The implications of the findings is that pregnant women and their partners need counseling about pregnancy changes so that they know what to expect and so as to be psychologically and emotionally prepared for the pregnancy changes and so adjust to progression of pregnancy. Pregnant adolescents require counseling about the changes of adolescence as well of those pregnancies (Caldwell et al 1994). Therefore pregnant adolescent survivors need counseling about pregnancy changes, adolescent changes and domestic violence, in order to help them make strategic decisions. Likewise both women and men need to know about the likely severe consequences (psychological as well as physical) of domestic violence for both the mother and the child.

4. One of the manifestations of failure to cope with the stress of domestic violence is problem in making strategic decisions and identifying sources of support. Such sources include partners, friends, parents, health workers and other adults. Such support is essential for developing self esteem. Adolescents require counseling on life skills that could improve their self esteem.

**11.1.4 Issues of Trustworthiness in Qualitative Research Reported In This Thesis**

Qualitative methods are most suitable where the research question is to describe people’s experiences, norms or behaviour (Morse & Field 1996; Barbour 2000; Malterud 2001; Dahlgren et al 2004). The strategy to ensure rigor is a holistic approach with systematic research design, data collection and interpretation (Pope & Mays 1995), employing a naturalistic, interpretive approach to the subject matter (Jones 1995). Qualitative research is based on four assumptions (ontological, axiological, epistemological and methodological).

1. From the **ontological assumption** which concerns reality, reality is socially-constructed, therefore multiple realities exist (Morse & Field 1996; Dahlgren et al 2004). The goal is to discover these subjective realities in a particular context (Sarantakos 1998, pp 119; Dahlgren et al 2004); and interpret the separate parts within the overall context (Morse & Field 1996; Dahlgren et al 2004).

2. From the **axiological assumption**, research is value-bound and not value-free (Dahlgren et al 2004), since researchers embark on research with their own values and beliefs.

3. The **epistemological assumption** relates to the generation of knowledge (how researchers interact with the researched to generate knowledge).

4. From the **methodological assumption**, qualitative research is inductive, holistic, context-specific and follows an emergent design.
In this thesis, the purpose of qualitative research was to describe a phenomenon (domestic violence during pregnancy (Papers II and III) and to describe the process of coping among pregnant adolescent survivors (Paper IV), from the perspective of the participants. Triangulation of qualitative research methods was suitable in answering research questions.

The study design
As suggested by Miles & Huberman (1994) and Sarantakos (1998), formulation of research questions was central in construction of the conceptual framework. The research was holistic (considered several different contextual factors in design and analysis), and findings obtained are specific for time and context. In using methodological triangulation, we chose the pragmatist view where methods may be mixed within one study (Ford-Gilboe et al 1995; Morse & Field 1996; Berman et al 1998; Dahlgren et al 2004). However, some researchers of the purist view (Baker 1992; Becker 1993; Barbour 1998; Carey 1993) disapprove of this approach (of mixing methods or paradigms) arguing that it diminishes methodological rigor. Where quantitative designs employ qualitative instruments, however, method mix is recommended (Morse & Field 1996), such that it is the results that are triangulated (Morse 1991). In the thesis, the Abuse Assessment Screen used to assess domestic violence and the Severity of Violence Against Women scales are qualitative instruments. From the situationalist view, method mix may be sequential or simultaneous (Morse and Field 1996), depending on which is the preferred sequence and what is considered the principle methodology (Morgan 1998). Qualitative research is systematic and naturalistic, and describes reality as experienced by the respondents (Editorial 1999; Patton 2002).

Setting and participants
Papers II and III describe the context in detail (the community setting consisting of two sub-counties of Wakiso district). A key feature of qualitative research design used in this thesis was use of an emergent design (Dahlgren et al 2004) where the research was not fully spelt out at the beginning of the project (especially with regard to participant selection), as demonstrated in the 3 qualitative research papers. In papers II and III, the emergent design involved sequential use of FGDs, in-depth interviews and case vignettes. The issues explored in subsequent FGDs depended on what was discussed in preceding groups. Secondly, the potential participants in the in-depth interviews were suggested by FGD participants or fellow interviewees. Thirdly, issues further explored in case-vignettes were hypothetical situations from participants’ views (from FGDs and interviews). In paper IV, participants were systematically selected dependent on views of prior interviewees (so as to test the emergent theory), and included women who reported violence in a prior pregnancy.

Participant selection markedly influences the quality of data in qualitative research (Coyne 1997), therefore sampling is purposive such that participants are identified for various reasons that make them information-rich (Sandelowski 1995) and therefore ‘theoretically representative’ (Miles & Huberman 1994). Morse (1991) calls such participants ‘good’ and describes them as those who are articulate, reflexive and willing to share with the interviewer. The participant selection criteria used in this thesis was as follows:

i) In order to provide information according to varied dimensions or context of the problem (maximum variation sampling). This was used in Papers II and III. Participants from rural and urban areas, both single and married, employed and unemployed, were included in FGDs and case vignettes.

ii) As determined by the emergent theory until saturation (substantial new information central to the emerging theory is no longer obtained). This is theoretical sampling (Coyne 1997; Patton 2002) and was used in Paper IV.

iii) For their being extreme or deviant cases to test emergent theories (Paper IV). Some participants were selected because of or special attributes such as age (young or
older adolescent), parity (multiparous or primigravida) and marital status (single, married or separated).

Data analysis
With thematic analysis (Paper II and III), analysis may end at stage of describing the phenomenon (Burnard 1991), whereas with Grounded theory (Paper IV), a theory or model may be generated (Morse & Field 1996). Existing theory may be used to explain the data. In paper II, III and IV, theories by Heise (1989), Landenburger (1989), Counts et al (1989), Silberschmidt (1991) ans Chen et al (1992) were used. Discrepant perspectives are part of and enrich the context as long as they are reported within the particular context (Morse & Field 1996). In Paper IV, these included views of multiparous adolescents and those respondents reporting violence in a prior pregnancy.

Evaluation of the credibility or trustworthiness of the qualitative research in the thesis
The attributes of trustworthiness are explained by Miles and Huberman (1994) as follows:
1. Objectivity (neutrality): the research/researcher is neutral and unbiased.
2. Reliability (dependability or auditability): the research findings are consistent or reliable.
3. Internal validity refers to the credibility, authenticity or truth value of the research.
4. External validity (generalisability, fittingness or applicability) refers to generalisability of the findings (model or theories) to different settings beyond the research context.

Credibility (often referred to as trustworthiness, validity or authenticity) is enhanced in a number of ways (Miles & Huberman 1994). The findings (theory or model) are generalized beyond the small sample (thus transferred to other contexts) through logical reasoning or analytical generalization (Dahlgren et al 2004). These include (Sarantakos 1998):
1. Cumulative validation (study findings supported by subsequent studies);
2. Communicative validation (additional questioning of respondents);
3. Argumentative validation (findings are presented so that conclusions can be made);
4. Ecological validation (conducting the study in the natural environment of the subjects and using suitable methods);
5. Triangulation (using multiple methods for data collection, analysis or interpretation).

Credibility in qualitative research, as shown in this thesis, is enhanced by several ways:
- Triangulation and negative case analysis (Morse & Field 1996; Dahlgren et al 2004). These capture the multiple realities of the problem

Lincoln and Guba (1985) propose four alternatives to validity, reliability, generalisability and objectivity, namely (and respectively) credibility, transferability, dependability and confirmability, a view accepted by Sandelowski (1986) and Morse (1999):
1. They argue that researchers do not need to demonstrate validity/credibility but rather methodological excellence (conduct research in a professional and systematic manner as demonstrated in this thesis).
2. Instead of generalisability, they recommend transferability. As demonstrated in this thesis, the researcher should state in detail how the research was undertaken leaving it to those interested in the findings to decide whether they can be generalised or not, and whether or not findings are applicable to their contexts and settings. Use of triangulation improves both transferability and credibility.
3. Regarding reliability, dependability is the closest one may get to reliability in a constantly changing world. The systematic manner in which the qualitative studies that constitute this thesis makes the findings reliable, consistent and therefore dependable.
4. Instead of objectivity, Lincoln and Guba (1985) suggest confirmability, whereby confirming data shifts the evaluation from the researcher to the data itself.
11.2 QUANTITATIVE STUDIES

11.2.1 Risk Factors, Nature and Severity of Domestic Violence During Pregnancy Among Women Attending Antenatal Care In Mulago Hospital (Paper I)

The study design

The study design used was a cross-sectional study among first-time antenatal clinic attendees, in whom the prevalence and nature of domestic violence during pregnancy and in the previous one year was assessed. Factors associated with domestic violence were assessed from socio-demographic and reproductive history, domicile and social habits. Domestic violence was assessed using the Abuse Assessment Screen. Data was analyzed using chi-square test for categorical variables and Student’s $t$-test for numerical variables.

The main findings

1. Of the 379 women, 169 (44.6%) were aged 11-19 years, 138 (36.4%) were aged 21-30 years, 69 (18.2%) were aged 31-40 years, 2 (0.5%) were above 40 years. Two hundred and twelve of 379 women interviewed (57.1%) reported domestic violence in the index pregnancy. Sixteen of these (7.0%) reported physical abuse alone, 13 (5.7%) reported sexual abuse alone, 84 (37.0%) reported emotional/psychological abuse alone; 16 (7.0%) reported both physical and sexual abuse, while 98 (43.2%) reported all three types. The perpetrator was a spouse for 127 (59.1%), an ex-spouse/ex-boyfriend for 11 (5.1%), an in-law for 60 (27.9%), and a relative for 17 (7.9%). Physical assault was reported by 144 women (40.7%) in the year preceding the pregnancy, and 123 (32.4%) reported prior assault.

2. Adolescents (compared to older women) and primigravidae (compared to multiparous women) were more likely to have history of domestic violence in the index pregnancy (p<0.001). Regarding domicile, 204 women (53.8%) stayed in an extended family in the same household; 48 (12.7%) stayed with in-laws, while 156 (41.2%) stayed with other relatives. There was no significant association between the area of the domicile (peri-urban or rural) and domestic violence in the index pregnancy. 285 subjects (76.0%) were from low-income, and hence, low socioeconomic status group (had no electricity, television, or running water, and domicile had 2 bedrooms or less).

3. On antenatal care attendance, 14.2 % had index visit during the first trimester, 245 (64.6%) who attended early had medical/obstetric complaints. Only 135 (35.8%) had ever used contraceptives, and for 184 (48.5%), this pregnancy was not planned. Those who had history of domestic violence in the index pregnancy were more likely to have booked antenatal care beyond the second trimester (p<0.001).

4. Physical abuse and witnessing abuse in childhood were significantly associated with physical abuse in the index pregnancy (p=0.023 and p<0.001 respectively). Other than staying with a co-wife, no other factors were significantly associated with domestic violence. Most women had moderate to severe violence. Only 53 (24.5%) sought any medical care, and only 100 (46.1%) sought any form of counseling.

Discussion of the study findings

In a cross-sectional study, the status of an individual with respect to the presence of exposure or outcome is assessed at the same point in time (Kelsey et al 1996). Therefore, one can not distinguish whether the exposure preceded the development of the outcome or whether presence of the disease/outcome affected the individual’s level of exposure (Rothman 1986; Hennekens & Buring 1987; Kelsey et al 1996). The cross-sectional study is useful for assessing the magnitude of a disease, describing individuals with the disease and for hypothesis generation (rather than hypothesis testing). Cross sectional studies answer the questions: Who? Where? When? (Rothman 1986; Hennekens & Buring 1987).
There are three methods of hypothesis formulation (Hennekens and Buring (1987):

i)  **Method of differences**: Recognizing that if the frequency differs markedly in two sets of circumstances, the disease may be caused by some particular factor that differs between them.

ii) **Method of agreement**: refers to observation that a single factor is common to a number of circumstances in which a disease occurs with high frequency.

iii) **Method of concomitant variation**: Refers to circumstances in which the frequency of factors varies in proportion to the frequency of disease.

From this cross-sectional study, we developed several testable hypotheses:

1. Domestic violence during pregnancy is associated with unintended pregnancy
2. Domestic violence during pregnancy is commoner among adolescents compared to older women
3. Domicile-related factors (such as whether domicile is nuclear or extended, rural or urban, and household decision-making power of the women) are associated with domestic violence during pregnancy

As noted in a review of risk factors for domestic violence in pregnancy (Mayer & Leibschutz 1998), risk factors include young age, being an adolescent, being single, living alone, living in a crowded environment, low socio-economic status, alcohol use by both partners, prior diagnosis of depression, pregnancy unintended-ness and abuse prior to conception. Most of the women who experience violence as adults have witnessed violence as adolescents or children (Hibbard 1985, Pearlman et al 1990; McFarlane et al 1992; Gazmararian et al 1996; Kaye 2001b; Kaye et al 2002).

The finding of a young age and lower education study is similar to findings from Brazil (Moraes & Reichenheim 2002). In this study, domestic violence during pregnancy occurred mainly among adolescents with less schooling, who did not work outside the home, with little social support, more under-five children and of low socio-economic status. The study findings also suggest an association between domestic violence during pregnancy and unplanned pregnancy. This association has previously been suggested by studies in the Chinese community (Leung et al 1999). The cause of this was explained by the qualitative study in Wakiso district, Uganda (Kaye et al 2005).

This study further shows that it is feasible to use the Abuse Assessment Screen in the antenatal clinic to screen for domestic violence during pregnancy. It also suggests that the Abuse Assessment Screen and the Severity of Violence against Women scale are acceptable for domestic violence screening. From a study conducted in the emergency departments (ED) in California, United States, regarding acceptability of screening for domestic violence in such areas (Hayden et al 1997), the ED is an appropriate setting to discuss domestic violence issues. Many women will disclose violence only if asked directly about it and many survivors feel comfortable discussing domestic violence with ED physicians and nurses.
11.2.2 Domestic Violence is A Risk Factor For Unwanted Pregnancy And Induced Abortion (Paper V)

The study design
This case-control study was conducted from September 2003 through June 2004, among 942 women seeking post-abortion care in Mulago hospital. Direct inquiry, records review and clinical examination identified 333 women with induced abortion (cases) and 609 with spontaneous abortion (controls). Cases and controls were compared by socio-demographic characteristics, pregnancy intention, household decision-making power and domestic violence. The exposure (domestic violence during pregnancy) was assessed using the Abuse Assessment Screen (McFarlane et al 1992) for both cases and controls. The magnitude of this exposure was assessed with the Severity of Violence against Women scale (Marshall 1992). Data was analyzed with EPI-INFO and SPSS Software using Student t-test and ANOVA for continuous variables and Chi-square (or Fisher’s test) for categorical variables. Stratified, and Multivariate logistic regression analyses were used to adjust for confounding and interaction, at the 95% confidence level.

Main findings
1. Women with induced abortion (cases) significantly differed from controls (women with spontaneous abortion) as they were younger or more often single; had lower parity and education, less household decision-making and fewer living children. They were not significantly different from controls (p>0.05) regarding employment, spouse’s age, years spent in marital relationship and domicile.
2. Cases had more mistimed, unplanned or unwanted pregnancy at conception and presentation (p<0.001 for all variables).
3. Cases were more likely to have recent history of domestic violence (physical, sexual or psychological) [OR 18.7 (95%CI 11.2-31.0)] after adjusting for age, pregnancy intention and marital status.
4. Tables 2-7 show several significant multivariate logistic regression models. They indicate that domestic violence during pregnancy was significantly associated with pregnancy intention and induced abortion after checking for interaction and adjusting for several potentially confounding factors.
5. Domestic violence during pregnancy was strongly associated with induced abortion, a relationship which persisted after adjusting for age, marital status, pregnancy intention and contraceptive use (Kaye et al 2006). This association appeared to be modified by pregnancy timing, covert contraceptive use and contraception around the time of pregnancy.

Discussion of the study findings
The study design used was a case-control study. Here a group of subjects with a ‘disease’ of interest and a control group of individuals without the disease are investigated by comparing the proportions of individuals with the exposure of interest in the 2 groups (Rothman 1986; Kelsey et al 1996). In this study the cases were women with induced abortion, controls were women with spontaneous abortion and the exposure was domestic violence during pregnancy. The exposure of interest that was compared in these participants was domestic violence during pregnancy, during the preceding year prior to conception and lifetime prevalence of domestic violence.

Classification of the disease must ensure that it is as homogeneous as possible. Strict combined diagnostic criteria that used clinical data, patients’ records review and direct inquiry to determine abortion status for the disease/outcome was used in this study. Cases were women diagnosed as induced abortion and controls were women diagnosed as spontaneous abortion using these criteria.
Case-control studies can evaluate several potential aetiologic exposures that relate to a specific outcome or disease as well as interrelationships among them (Breslow & Day 1980; Schlesselman 1982; Breslow & Day 1984). Since both the exposure and disease have already occurred by onset of the study, case-control studies are prone to bias from differential selection of controls or cases on the basis of their exposure status, differential reporting (or recording) of exposure information between study groups and bias from confounding (Kahn 1983; Hennekens & Buring 1987, Kelsey et al 1996). This bias must either be minimized or avoided.

**Evaluation of potential measurement bias**

In this study, attempts were made to evaluate reproducibility and repeatability of the data collected (evaluate information bias) by determining inter-rater and intra-rater consistence in getting data from participants. Here Kappa statistic was used. Misclassification errors may cause bias resulting from categorization of either exposure or disease status (Rothman 1986; Kelsey et al 1996). If the misclassification in one axis is independent of the other, the misclassification is random or non-differential (where exposure or disease status is incorrect for the same proportions of subjects in the cases and controls being compared). If the two proportions differ, the misclassification of exposure is not independent of disease status (is non-random or differential). While random misclassification often (Dosemeci et al 1990; Kristensen 1992; Weinberg et al 1994) causes under-estimation of the true relative risk, differential misclassification may under-rate or exaggerate the true relative risk (Rothman 1986; Hennekens & Buring 1987; Dosemeci et al 1990; Kristensen 1992; Kelsey et al 1996). Therefore, random misclassification is a less serious problem regarding validity.

**Data analysis**

Analysis of case-control studies is basically a comparison between cases and controls with respect to the frequency of exposure under investigation (Breslow & Day 1984; Hennekens & Buring 1987; Kelsey et al 1996). Controls should be representative of the population of all non-diseased persons (those at risk of getting the disease). Cases and controls should be compared to assess baseline risk associated with development of the disease irrespective of the exposure investigated. After adjusting for potential factors which may confound or modify the effect of the exposure on the outcome, adjusted odds ratios and their confidence intervals are computed. Stratified analysis was used to check for interaction and confounding, while multivariate analysis was used to adjust for confounding of the association (by several potential factors such as age, marital status, pregnancy intention and domicile-related factors) between domestic violence and induced abortion.

**Stratified analysis**

Stratified analysis as used in this paper permits evaluation of effect modification and confounding, thus enabling clear understanding of the interrelationships among the exposure, disease and any additional confounding or effect modifying variables (Hennekens & Buring 1987). The main reason for stratification is to determine whether the stratifying variable modifies or confounds the exposure-disease relationship. The limitation of stratified analysis is that it can not control simultaneously a large number of potential confounders. If the p-value (for the test for interaction) is greater than 0.05, there is no significant interaction. When there is no interaction, the stratum-specific odds ratios are similar. If the odds ratios differ by stratum, then the p-value of the test for interaction is less than 0.05, indicating interaction. If the crude and adjusted parameters differ by 5% or more, then the stratifying variable is a confounder. If there is any interaction, it is the stratum-specific values that are presented. If there is confounding, the adjusted values are presented. The adjusted odds ratios are more valid estimate of the effect though less precise (as indicated by the wider confidence intervals in Paper IV).
Evaluation of our study hypothesis

Although we hypothesized that violence leads to unintended pregnancy, which may be unwanted and may eventual be terminated, the converse may be true that unintended pregnancy leads to domestic violence. Our hypothesis is supported by previous research which shows that violence precedes the unintended pregnancy, and for most women with domestic violence during pregnancy, it preceded conception (Helton et al 1987, Stewart & Cecutti 1993, Evins & Chescheir 1996, Glander et al 1998). It is also further supported by evidence that women’s perceptions of wantedness may change over time or over the course of pregnancy, to the extent that even a pregnancy that was originally considered unwanted may later on be wanted after birth (Moos et al 1997; Bankole & Westoff 1998). Pregnancy intention (often also called wantedness) is therefore dependent on several factors, among which is attitude of partners, family members and friends (Moos et al 1997). In many studies on domestic violence during pregnancy, this violence precedes pregnancy, though its frequency may change (Ballard et al 1998; Ellsberg et al 2000; Kaye et al 2002; Castro et al 2003).

The study shows that domestic violence is a risk factor for unwanted pregnancy and induced abortion. The explanation for the results is that some women may conceive unintentionally after sexual violence. Such an unplanned pregnancy may be wanted, mistimed or even unwanted. Secondly, the finding may be due to lack of fertility control associated with domestic violence. Poor partner communication (Blanc et al 1995; Wolff et al 2000) may be associated with high clandestine contraception rates which are likewise associated with high contraceptive failure rates (Biddlecom & Fapohunda 1998) or non-contraception. Women within a relationship or community where gender inequality (women’s lack of autonomy, low status, patriarchal control or domestic violence) is common may live in fear and therefore lack ability to control fertility, thereby having high risk of unintended pregnancy (Ellsberg et al 2000; Pallitto & O’Campo 2004, Pallitto & O’Campo 2005). This lack of autonomy has been closely linked with lack of fertility control (through influencing contraceptive use) in other studies (Dyson & Moore 1983; Govindasamy & Mahotra 1996). High fertility may be linked to high value attached to children (Castle 2003).

The association between domestic violence and either pregnancy termination or induced abortion (Kaye et al 2006) has been described in other studies. A study in Mulago Hospital prior to the present study (Kaye 2001b) found a high prevalence of domestic violence among women seeking postabortion care. Many women reported that the pregnancy was induced as exemplified in 3 cases (Kaye 2001a). From a hospital-based study in Canada, Lumsden (1997) found a much higher prevalence of domestic violence in women attending an abortion clinic than that found in pregnant women who carried the pregnancy to term (Helton et al 1985; Stewart & Cecutti 1993) in the same population. Leung et al (2002) and Wu et al (2005) in studies among ethnic Chinese similarly found high prevalence of domestic violence in women seeking pregnancy termination. Wu et al (2005) in a cross-section study among women seeking elective pregnancy termination in China found that of 1215 women, 22.6% reported domestic violence, of which 18.1% was sexual, 7.8% was physical and 3.0% was psychological. This study also found an association between having ever induced an abortion and domestic violence, as the proportion of women reporting domestic violence was higher among those who had induced abortion. Similarly, a high lifetime prevalence of family violence was found among women attending an abortion clinic in New Zealand (Whitehead & Fanslow 2005).

The finding of an association between domestic violence, unwanted pregnancy and induced abortion (Kaye et al 2006) is in agreement with Marston and Cleland (2003) who described
contraception and induced abortion as representing alternative means of achieving fertility in
the population. While increased contraceptive use is expected to cause a decline in induced
abortion, the opposite is seen in practice in countries that have not entered the fertility
transition. Despite taking no appropriate measures to prevent pregnancy, many women in
such countries report that they want no more children (Westoff & Bankole 1994; Bongaarts
& Bruce 1995). As fertility decreases, couples increasingly want to have fewer children
(increasing the need for contraception). Non-use of contraceptives leads to increased
exposure to risk of unintended pregnancy and thereby risk of induced abortion. Domestic
violence contributes to the unmet need for contraception thereby increasing the risk of
unintended pregnancy (Pallitto & O’Campo 2004) and therefore to risk of unwanted
pregnancy and induced abortion.

Since pregnancy termination is strongly associated with unwanted pregnancy, it is most
likely than those terminated pregnancies were unwanted (Torres & Forrest 1988). Studies
from Colombia have shown a significant association between a prior unintended pregnancy
found a significant association between domestic violence and unintended pregnancies
(pregnancies that were conceived less than two years after a prior pregnancy). The likely
association between domestic violence and repeat induced abortion is supported by research
from China (Leung et al 2002) and New Zealand (Whitehead & Fanslow 2005). In both
studies (at bivariate analysis) having an induced abortion prior was strongly associated with
showed a significant association between prior induced abortion and domestic violence.

Table 2. Regression model showing the risk of domestic
violence during pregnancy in cases and controls adjusted
for Inter-pregnancy interval and pregnancy intention

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic violence during pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td>0.05</td>
</tr>
<tr>
<td>No</td>
<td>0.05</td>
<td>0.03-0.09</td>
</tr>
<tr>
<td>Inter-pregnancy interval (months)</td>
<td>0.99</td>
<td>0.98-1.0</td>
</tr>
<tr>
<td>Pregnancy was planned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td>5.7</td>
</tr>
<tr>
<td>No</td>
<td>5.7</td>
<td>3.3-9.9</td>
</tr>
<tr>
<td>Pregnancy wanted at presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td>5.9</td>
</tr>
<tr>
<td>No</td>
<td>5.9</td>
<td>3.5-9.9</td>
</tr>
</tbody>
</table>

Goodness of fit chi square 7.8, p=0.452; Ref= Reference Group
Table 3. Regression model showing the risk of domestic violence during pregnancy in cases and controls adjusted for marital status and pregnancy intention

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal age (years)</td>
<td>0.93</td>
<td>0.90-0.97</td>
</tr>
<tr>
<td>Domestic violence during pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18.2</td>
<td>11.1-29.8</td>
</tr>
<tr>
<td>No</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Pregnancy was planned</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6.8</td>
<td>3.8-12.1</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy wanted at presentation</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.4</td>
<td>1.4-4.1</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>2.2</td>
<td>1.5-3.2</td>
</tr>
<tr>
<td>Ever-married</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Goodness of fit chi square 166.6, p=0.325; Ref= Reference Group

Table 4. Regression model showing the severity of domestic violence during pregnancy in cases and controls adjusted marital status and pregnancy intention

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal age (years)</td>
<td>0.9</td>
<td>0.9-1.1</td>
</tr>
<tr>
<td>*Severity of domestic violence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate or Severe</td>
<td>1.5</td>
<td>1.2-3.2</td>
</tr>
<tr>
<td>Mild or Symbolic</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Pregnancy was planned</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21.9</td>
<td>5.4-88.7</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy wanted at presentation</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.4</td>
<td>0.4-4.5</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>1.2</td>
<td>1.0-3.4</td>
</tr>
<tr>
<td>Ever-married</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Goodness of fit chi square 102.3, p=0.5,

* Domestic violence in pregnancy dropped from regression model due to collinearity with severity of violence; Ref= Reference Group
Table 5: Results of logistic regression analysis showing pregnancy intention and domestic violence during pregnancy adjusted for interaction with contraceptive ever-use

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Domestic violence and covert contraceptive use</td>
<td>0.3</td>
<td>0.0-1.9</td>
</tr>
<tr>
<td>*Domestic violence and contraception in 3 months prior to conception</td>
<td>0.8</td>
<td>0.1-5.7</td>
</tr>
<tr>
<td>*Domestic violence during pregnancy and pregnancy timing</td>
<td>1.6</td>
<td>0.2-13.3</td>
</tr>
<tr>
<td>Domestic violence during pregnancy</td>
<td>0.1</td>
<td>0.0-0.7</td>
</tr>
<tr>
<td>Pregnancy was unplanned</td>
<td>1.8</td>
<td>0.7-4.6</td>
</tr>
<tr>
<td>Pregnancy was unwanted</td>
<td>0.1</td>
<td>0.0-0.3</td>
</tr>
<tr>
<td>Age (years)</td>
<td>1.1</td>
<td>1.0-1.1</td>
</tr>
</tbody>
</table>

Goodness of fit chi square 9.96, p=0.979, *Interaction present versus absent

Table 6: Interaction of domestic violence during pregnancy, pregnancy intention and contraceptive use adjusted for in logistic regression.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Domestic violence and covert contraceptive use</td>
<td>4.1</td>
<td>0.5-31.3</td>
</tr>
<tr>
<td>*Domestic violence and contraception in 3 months prior to conception</td>
<td>1.3</td>
<td>0.2-9.7</td>
</tr>
<tr>
<td>*Domestic violence during pregnancy and pregnancy timing</td>
<td>0.6</td>
<td>0.1-5.4</td>
</tr>
<tr>
<td>Domestic violence during pregnancy</td>
<td>16.6</td>
<td>1.4-202.6</td>
</tr>
<tr>
<td>Pregnancy was unplanned</td>
<td>0.6</td>
<td>0.2-1.5</td>
</tr>
<tr>
<td>Pregnancy was unwanted</td>
<td>8.8</td>
<td>3.4-22.7</td>
</tr>
<tr>
<td>Age (years)</td>
<td>0.9</td>
<td>0.9-1.0</td>
</tr>
<tr>
<td>Marital status (Single versus ever-married)</td>
<td>0.8</td>
<td>0.3-1.8</td>
</tr>
</tbody>
</table>

Goodness of fit chi square 106.3, p=0.918, *Interaction present versus absent; Ref= Reference Group
Table 7. Regression model showing the risk of domestic violence during pregnancy in cases and controls adjusted parity, marital status and pregnancy intention

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td>0.8</td>
<td>0.7-0.9</td>
</tr>
<tr>
<td>Domestic violence during pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18.2</td>
<td>10.9-30.2</td>
</tr>
<tr>
<td>No</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Pregnancy was planned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.2</td>
<td>0.1-0.4</td>
</tr>
<tr>
<td>No</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Pregnancy was wanted at conception</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td>0.9-2.8</td>
</tr>
<tr>
<td>No</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Pregnancy wanted at presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td>3.5-8.6</td>
</tr>
<tr>
<td>No</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>Ref</td>
<td>0.4-0.9</td>
</tr>
<tr>
<td>Ever-married</td>
<td>0.6</td>
<td></td>
</tr>
</tbody>
</table>

Ref= Reference Group

11.2.3 Reasons, methods used and decision-making for pregnancy termination for adolescents and older women.

Analysis of data comparing adolescents and older women (Kaye et al 2005b) showed that domestic violence is a contextual factor in women who terminate pregnancy (see Table 8). Gender inequality in reproductive decision-making is a key element of the social context of reproductive health in Uganda (Kaye et al 2005a), and often couples disagree on desirability of pregnancy or use of contraceptives (Bankole & Singh 1998; Becker 1999; Speizer 1999; Kaye et al 2005a). Even when they approve of family planning in principle, some men may disapprove of practicing family planning, thereby contributing to unintended pregnancy (Blanc 2001). In case of disagreement, the men’s opinions may overrule the women’s, even though it is women that have to implement these reproductive choices (Speizer et al 2005).

Generally, the reasons for pregnancy termination (Kaye et al 2005b) for adolescents and older women and the subsequent complications did not significantly differ (Table 9). This implies that similar contextual factors apply for and similar methods were used by adolescents and women of older age. Male partners influence the decision-making process to terminate unwanted pregnancy by creating situations which force women to consider or procure abortion (Kaye et al 2005b). These include abandoning the pregnant woman, insisting that family size is complete (can not afford another child), denial of paternity or domestic violence. They may also meet the cost of abortion. Secondly, decisions of the male partners influence the abortion decision-making process through influencing contraceptive use, pregnancy intention (planning, timing or wantedness) and pregnancy social acceptability. Lastly, men may be involved in procuring or paying for abortion services.
Implication of the research findings
The association of induced abortion and domestic violence has important implications for the management of women presenting for post-abortion care. Firstly, abortions are illegal (or restricted) in most African countries, and only few women present to the healthcare system after abortion. Such women present an opportunity to screen and counsel for ongoing domestic violence. Secondly, such women are at higher risk of prior or ongoing domestic violence than women having an index pregnancy termination, and hence higher need for routine screening and counseling for domestic violence. Thirdly, women who report domestic violence at any time are at further risk of violence. A positive screen for domestic violence is an indicator of high risk for subsequent (and even more severe) physical, sexual or psychological violence (Koziol-McLain et al 2001, Houry et al 2004). Failure to screen and counsel these women would constitute a missed opportunity for domestic violence screening. Fourthly, the study findings highlight the need to include domestic violence counseling on the contraception counseling provided to clients seeking family planning services. Lastly, the findings confirm the view that factors associated with non-use of contraceptives go beyond supply and accessibility issues.
Table 8: Main and secondary reasons for terminating pregnancy

<table>
<thead>
<tr>
<th>Main Reason (n=257)</th>
<th>Adolescents (n=104)</th>
<th>Older women (n=153)</th>
<th>Odds ratio (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n       ( %)</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Abuse by parents*</td>
<td>2       (1.9)</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>Academic considerations</td>
<td>32 (30.7)</td>
<td>1</td>
<td>(0.7)</td>
</tr>
<tr>
<td>Economic considerations</td>
<td>7       (6.7)</td>
<td>15</td>
<td>(9.8)</td>
</tr>
<tr>
<td>Feared parents*</td>
<td>19      (18.3)</td>
<td>3</td>
<td>(1.9)</td>
</tr>
<tr>
<td>Job-related</td>
<td>2       (1.9)</td>
<td>5</td>
<td>(3.3)</td>
</tr>
<tr>
<td>Relationship-related† (Denial of paternity)</td>
<td>24       (23.0)</td>
<td>60</td>
<td>(39.2)</td>
</tr>
<tr>
<td>Sexual violence</td>
<td>3       (2.8)</td>
<td>10</td>
<td>(6.6)</td>
</tr>
<tr>
<td>Pregnancy was unwanted‡</td>
<td>15   (14.4)</td>
<td>45</td>
<td>(29.4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary reasons considered</th>
<th>Adolescents n</th>
<th>Older women n</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>46 (45.5)</td>
<td>50 (32.5)</td>
<td>1.7 (1.0-3.0)</td>
</tr>
<tr>
<td>Completed family size</td>
<td>9 (8.9)</td>
<td>20 (13.0)</td>
<td>0.7 (0.3-1.6)</td>
</tr>
<tr>
<td>Feared parents; was a student</td>
<td>4 (4.0)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Wanted to secure her job</td>
<td>1 (1.0)</td>
<td>5 (0.6)</td>
<td>0.3 (0.0-2.7)</td>
</tr>
<tr>
<td>Medical reasons**</td>
<td>0 (0.0)</td>
<td>5 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Mixed**</td>
<td>8 (7.9)</td>
<td>8 (5.2)</td>
<td>1.6 (0.5-4.8)</td>
</tr>
<tr>
<td>Relationship related (abandonment by spouse)</td>
<td>19 (18.8)</td>
<td>38 (24.7)</td>
<td>0.7 (0.4-1.4)</td>
</tr>
<tr>
<td>Social reasons (pregnancy unacceptable)</td>
<td>14 (13.8)</td>
<td>28 (18.2)</td>
<td>0.7 (0.3-1.5)</td>
</tr>
</tbody>
</table>

*p<0.001; †p=0.007; ‡ p=0.005

**Mixed refers to a combination of economic, relationship-related and perceived contraceptive failure.

∞Medical reasons were that the woman was HIV positive

$ Many respondents gave more than one reason, while some women gave only the main reason
Table 9: Methods used to terminate pregnancy and complications that resulted

<table>
<thead>
<tr>
<th>Methods (n=257)</th>
<th>Adolescents (n=99)</th>
<th>Older women (n=158)</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inserted herbs in the genitalia</td>
<td>26 (26.3)</td>
<td>43 (27.2)</td>
<td>1.0 (0.5-1.8)</td>
</tr>
<tr>
<td>Ingested herbal medicine</td>
<td>9 (9.1)</td>
<td>14 (8.9)</td>
<td>1.0 (0.4-2.7)</td>
</tr>
<tr>
<td>Took tablets and was given an injection</td>
<td>0 (0.0)</td>
<td>2 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Received an injection</td>
<td>1 (1.0)</td>
<td>4 (2.5)</td>
<td>0.4 (0.0-3.8)</td>
</tr>
<tr>
<td>Used both herbal (oral) medicine and instruments</td>
<td>0 (0.0)</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Received an injection and eventually instruments</td>
<td>0 (0.0)</td>
<td>2 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Used instruments</td>
<td>50 (50.5)</td>
<td>72 (45.6)</td>
<td>1.2 (0.7-2.0)</td>
</tr>
<tr>
<td>Personally Inserted a stick or other object into cervix</td>
<td>1 (1.0)</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Inserted tablets in the genitalia</td>
<td>6 (6.0)</td>
<td>11 (7.0)</td>
<td>0.9 (0.3-2.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complications</th>
<th>Adolescents (n=101)</th>
<th>Older women (n=154)</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower genital tract injuries</td>
<td>10 (9.6)</td>
<td>16 (9.4)</td>
<td>1.0 (0.4-2.5)</td>
</tr>
<tr>
<td>Cervical injuries</td>
<td>13 (12.5)</td>
<td>18 (10.8)</td>
<td>1.2 (0.5-2.7)</td>
</tr>
<tr>
<td>Uterine perforation</td>
<td>6 (5.9)</td>
<td>9 (5.4)</td>
<td>1.1 (0.3-3.5)</td>
</tr>
<tr>
<td>Post-abortional sepsis</td>
<td>28 (27.4)</td>
<td>47 (28.1)</td>
<td>1.0 (0.5-1.7)</td>
</tr>
<tr>
<td>Septic abortion</td>
<td>34 (33.3)</td>
<td>50 (30.3)</td>
<td>1.1 (0.6-2.0)</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>94 (92.2)</td>
<td>153 (91.6)</td>
<td>1.1 (0.4-2.9)</td>
</tr>
</tbody>
</table>

11.2.4 Low Birth Weight and Maternal Complications of Domestic Violence During Pregnancy in Mulago Hospital, Uganda (Paper VI)

Study design

This was a prospective cohort study conducted in Mulago hospital, Kampala, Uganda, among 612 women recruited in the second pregnancy trimester and followed up to delivery, from May 2004 through July 2005. The exposure (physical, sexual or psychological violence during pregnancy) was assessed using the Abuse Assessment Screen and the Severity of Violence against Women Scale. The relative and attributable risk of low birth weight and antepartum hospitalization was estimated using a General Linear Model and multivariate logistic regression analysis. Several potential confounders were adjusted for during the regression analysis.

Main findings

1. Participants in the 2 groups (exposed versus non-exposed) did not differ significantly on baseline characteristics, though there were significant difference in domicile and residence. Significantly fewer participants with domestic violence during pregnancy reported that pregnancy timing was appropriate (p=0.009) or that the pregnancy was planned (p=0.012). There was no significant difference in ever-use of modern contraceptives (p=0.074).

2. Women reporting domestic violence were more likely to deliver a low birth weight (LBW) infant, get pregnancy-related complications and receive antepartum
hospitalization when compared to women reporting no such history. There was a marginally significant difference regarding maturity status of the newborn (term, preterm or small-for-gestation); p=0.055. The mean birth weight of those with history of domestic violence was averagely 186g [(95%CI 76-296); p=0.001] lower, with no significant differences between adolescents and older women. The crude relative risk of a LBW for participants reporting domestic violence was 1.37 (95% CI 1.11-1.69) adjusted odds ratio 1.69 (95%CI 1.17-2.42). The relative risk of antepartum hospitalization for a pregnancy complication was 4.05 (95%CI 3.30-4.99), and Odds ratio 15.42 (95%CI 9.91-24.00).

3. Using Generalized linear modeling (GLM) in STATA to adjust for age, parity, number of living children, nature of prior pregnancy (abortion, preterm birth or term birth), pregnancy planning, domicile, number of years in marriage and household decision-making, the adjusted relative risk for LBW and antepartum hospitalization was [3.78 (95% CI 2.86-5.00) and 1.37 (95%CI 1.01-1.84)] respectively. After adjusting for age, parity and number of living children, domestic violence remained a risk factor for LBW during logistic regression analysis.

4. The incidence rate difference for LBW was 0.21 (95% CI 0.08-0.34) while that of antepartum hospitalization was 1.43 (95% CI 1.17-1.70). The corresponding attributable fraction for exposure was 0.41 (95%CI 0.19-0.57) and 0.94 (95%CI 0.91-0.96) respectively. The corresponding population attributable fractions were 0.19 and 0.74 respectively (p-values less than p<0.001). The rate difference is the difference in incidence rates between the exposed and unexposed, while the risk difference is the difference in risk of outcome (or disease) on comparing the unexposed and exposed (Kelsey et al 1996). Both can be used to assess attributable risk.

Discussion
Cohort studies are suitable for assessing multiple outcomes of an exposure (Breslow & Day 1987; Hennekens & Buring 1987). In this cohort, the exposure was domestic violence during pregnancy, while the primary outcomes were LBW and antepartum hospitalization. In such a cohort, subjects (classified according to absence or presence of the exposure to a particular factor) are followed up to determine development of a disease in each exposure group. At the time of defining exposure status, all potential subjects must be free of disease under investigation (Kahn 1983). The choice of group that comprises the exposed population depends on scientific and feasibility considerations, including frequency of exposure, need to get complete and accurate exposure and follow up information, and the nature of the particular research question being evaluated (Hennekens & Buring 1987; Kelsey et al 1996).

The primary requirement of a cohort study is to obtain accurate and complete information on all participants, particularly in ascertaining data on exposure and outcomes. For this reason, subjects may be recruited into a cohort depending on their ability to facilitate collection of relevant information (Hennekens & Buring 1987; Kelsey et al 1996), rather than their exposure status. In this study, inclusion of participants was restricted to those from near the hospital (30 km radius) who were most likely to deliver in the hospital. These two factors were part of the inclusion criteria for cases and controls.

The choice of participant group thus depends on both the hypotheses under investigation and specific features of the study design (Hennekens & Buring 1987). For the comparison group (unexposed population) the participants chosen should be similar to the exposed with respect to other factors related to the outcome (except the determinant under investigation). From this study, as seen in Tables 1 and 2, participants did not differ significantly regarding baseline characteristics, except for domicile, pregnancy intention and residence. If there is no association between the exposure and the disease, the disease (outcome) rates in the
populations being compared would be the same (Kelsey et al 1996; Hennekens & Buring 1987). For exposed and unexposed participants, information obtained should be accurate and complete. Where there are outcomes for which population rates are available, the outcome in the exposed population may be compared to the general population rate (Hennekens & Buring 1987; Kelsey et al 1996). Likewise, multiple comparison groups may be used in situations where no single group appears sufficiently similar to the exposed population.

The basic analysis of cohort studies involves comparison of incidence rates of outcome for exposed and unexposed populations (or different levels of exposures), depending on whether the denominator is number of individuals or person-time units (Fleiss 1982; Breslow & Day 1987; Greenland 1987; Kelsey 1996). The measure of association used depends on the purpose of the study, the way in which the characteristic or variable was measured, biological considerations and the study design (Kelsey et al 1996). Both relative and absolute measures of association can be calculated. The rate ratio is the ratio of rates of two groups which differ in the level of exposure to a risk factor for the disease under study. It is also called the incidence rate density.

\[
\text{Rate ratio} = \frac{\text{Incidence rate in the exposed}}{\text{Incidence rate in the unexposed}} = \frac{\text{Disease among exposed}}{\text{Disease among unexposed}}
\]

The risk ratio is based on calculation of probabilities of the disease and is applicable when the period within which the disease develops is fixed (Kelsey et al 1996).

\[
\text{Risk ratio} = \frac{\text{Probability of disease in the exposed fraction}}{\text{Probability of disease in the unexposed fraction}}
\]

The odds ratio is the ratio of odds of disease in the exposed to odds among the unexposed participants (Disease odds ratio).

If probability of getting a disease is \(P(D)\), then:

\[
\text{Odds in favour of } D = \frac{P(\text{Disease})}{P(\text{no Disease})} = \frac{P(\text{Disease})}{1-P(\text{Disease})}
\]

Therefore

\[
P(\text{Disease}) = \frac{\text{Odds of disease}}{1 + \text{Odds of disease}}
\]

Interpretation of the findings

The study findings are in agreement with Coker et al (1999) and Kernic et al (2000) who found that hospitalization was significantly associated and attributable to domestic violence. Our findings, however, differ from those of Parker et al (1994), who found a significant difference in the relationship between abuse and LBW when adult and were teenagers were compared. In their study, abuse was significantly associated with poor weight gain, smoking, late antenatal care attendance, anemia and maternal infections. In our study, the difference between adolescents and adult women regarding primary outcomes was not statistically significant, which could be due to other possible confounders that were not assessed. The effect of domestic violence may be mediated by other factors such as substance abuse and malnutrition (Kearney et al 2004).

Abuse may even lead to preterm delivery LBW through different mechanisms from that by which it causes term small-for-date delivery LBW (Newberger et al 1992, Petersen 1997). While LBW delivery may be a direct outcome of trauma, leading to preterm labour and delivery (Curry et al 1998; Cokkinides et al 1999; Janssen et al 2003), it may also arise from intrauterine growth restriction as a result of chronic stress (Dye et al 1995; Berenson et al 1997; Curry et al 1998). The evidence for stress as a risk factor for low birth weight has been demonstrated in several animal studies (Takahashi et al 1998). The effects are attributed to hyperactivity of the neuroendocrine axis, through affecting (levels of) stress hormones, immunological or physiological factors (Paarlberg et al 1995; Wadhwa et al
Depressed mood during pregnancy has been associated with poor antenatal care attendance, substance abuse, preterm delivery and low birth weight (Pagel et al 1990). Likewise, anxiety during pregnancy has been associated with impaired fetal development and LBW (Teixeira et al 1999).

Prenatal stress has been associated with several adverse outcomes including preterm labour and LBW through activation of the neuroendocrine hypothalamic-pituitary-adrenal or placenta-adrenal axes (Wadhwa et al 1993; Austin & Leader 2000; Harlbreich 2005). These studies provide the empirical evidence of the link between psychosocial stress and both gestational age at birth and infant birth weight in humans, which is mediated through increased levels of adrenal corticotrophic hormones and Cortisol.

**Evaluation of potential bias**

The main source of bias in a cohort study is error in classification of participants into exposed or unexposed populations or assessment of outcome. Misclassification adversely affects the interpretation of the results, especially if there is differential misclassification according to exposure status. Random misclassification tends to cause under-estimation of the true association between exposure and outcome (Hennekens & Buring 1987; Kelsey et al 1996). Differential misclassification biases the estimate (by over-estimating, under-estimating or leaving unchanged) of the true nature of the association (Breslow & Day 1987; Hennekens & Buring 1987; Kelsey et al 1996).

The strength of our study lies in the prospective design and evaluation of potential bias. Since, our participants were sampled independent of the exposure and had similar baseline characteristics, there was no selection bias and participants came from the same population sample. Secondly, information bias is unlikely since the assessors of pregnancy outcome were not the same research assistants who recruited the participants. To reduce selection and information bias, participants and research assistants (who recruited them or assessed the study outcomes) were unaware of the study hypothesis. Thirdly, the exposure was assessed on at least two different occasions, so that any violence that occurred during the course of the pregnancy meant to reclassification of the participants among the exposed. Lastly, participants were sampled independently of the main outcome (LBW) and the primary outcome (LBW) was verifiable. Multivariate analysis used in our study with birth weight a numerical variable and with LBW as a categorical variable enabled efficient estimation of association of risk of low birth weight while controlling for several potential confounders simultaneously, and yielded consistent results. All the models constructed to predict LBW or antepartum hospitalization were significant and fitted the data reasonably well. Therefore the study findings indicate valid association between domestic violence and both LBW delivery and antepartum hospitalization.

There were 84 (13.7%) participants lost during follow-up, which may bias the results. Effect of losses to follow-up usually depends on the magnitude, the likelihood of developing outcome or response and the measure of association used to quantify the relationship (Kelsey et al 1996, pp 131-187). If there are differences in exposure but not in disease rates, the rate ratio and risk ratio may be e biased but not the odds ratio (Kelsey et al 1996, pp 131-187). Since in a cohort study the outcome has not occurred at recruitment, there can not be selection bias according to the disease. We can not assess how much bias was caused by loss to follow-up. Given the strength of the association, results would not significantly differ if non-participants delivered either low or normal birth weight infants. If the rates of outcomes differed, the odds ratios of LBW delivery and antepartum hospitalization would still be valid estimates. The finding that odds ratios and relative risk estimate are in agreement validates
our findings, considering that both LBW delivery and antepartum hospitalization are common outcomes (Feinstein 1986).

Our findings indicate that domestic violence contributes significantly to the public health burden of low birth weight and hospitalization independent of maternal age and parity. After adjusting for age and other variables in logistic regression and General Linear Models, domestic violence was significantly associated with LBW and antepartum hospitalization. The prevalence of domestic violence during pregnancy is over 50% in our population (Kaye et al. 2002). While the attributable risk in Table 3 indicates the additional risk of either LBW or antepartum hospitalization following domestic violence, the relative risk (or relative rate) indicates how many times women with domestic violence are likely to manifest these two adverse outcomes (Fletcher & Fletcher 2005). The population-attributable risk takes into consideration the high prevalence of domestic violence to estimate the population risk (excess risk in the community associated with domestic violence), while the population attributable fraction indicates the fraction of the two adverse outcomes (in the population) associated with domestic violence (Fletcher & Fletcher 2005). Therefore the study findings indicate that domestic violence during pregnancy is a risk factor for both LBW delivery and antepartum hospitalization with a significant public health burden.

Study limitations
In the study, there are several limitations which we have to acknowledge.
1. There was no direct assessment of prenatal psychosocial stress or its mediators, such as Cortisol.
2. Secondly, we did not adjust for the gestation age at which this domestic violence occurred, nor its severity (at the particular gestation age) or frequency of episodes.
3. Thirdly, we did not adjust for the number or duration of hospitalization episodes, or verify some of the hospitalization records outside the study setting.
4. We did not assess the degree of coping or adaptation to domestic violence-related stress nor relate this to adverse pregnancy outcomes. The adverse effects of domestic violence on birth weight or gestation age at delivery are mediated partly through stress causing intrauterine fetal growth restriction or preterm labour (Wadhwa et al 1996, Halbreich 2005), so may be dependent on level of stress rather than domestic violence per se. Such adverse effects may depend on the level of emotional adaptation of the domestic violence survivors (Rini et al 1999; Halbreich 2005).
5. Several of the potential socio-economic variables that were not assessed and therefore not adjusted for could cause a non-differential classification and therefore cause underestimation of the relationship between domestic violence and adverse pregnancy outcomes.
11.2.5 Issues of Validity In Quantitative Research In This Thesis

Multivariate linear regression analysis

In Paper VI, the outcome (birth weight was used as both a continuous variable and low birth weight as a categorical variable). The method of least squares is used in the assessment of the coefficients. The fit of this regression line can be assessed by considering the residuals (the vertical distance of each point from the line: residual = observed y - fitted Y). For the line of best fit, the sum of the squared residuals is a minimum. The assumptions for linear regression are:

1. There is a linear relationship between x and y;
2. The observations in the sample are independent (no more than one pair of observations on an individual);
3. The distribution of y (for each value of x) follows a Normal distribution (the mean of the distribution of y lies on the true regression line);
4. The variability of the distributions of y values in the population is the same for all values of x (the variance is constant).
5. The variable can be measured without error.

The proportion of the total variation in y explained by the regression expressed as $R^2$ assesses the goodness of fit of the regression line. We can test the hypothesis that the true slope of the line $\beta = 0$. A significant result indicates evidence of a linear relationship between x and y.

Checking the assumptions

The residuals (difference between the observed and the fitted value of Y) are used to assess the assumptions. Normality: Figure 2 is a histogram showing the predicted residuals. They follow a normal distribution if assumptions are correct. Figure 3 shows a box plot which you get when the residuals are plotted. Linearity: Figure 4 shows a plot y against x (Q-Q plot) which gives an approximate straight line. Constant variance (Homoscedasticity): If residuals of birth weight are plotted against the fitted values of Y, a random scatter of points (as in Figure 5) is obtained. Note that the scatter progressively increases or decreases as $Y$ increases, as in Figure 5.

Collinearity and Checking for collinearity

Often predictor variables have relationships among themselves such that they are correlated and the p-values change as they are dropped from or added to the model. This implies that the effect of one is influenced by the presence of the other. When such variables are linearly related, this is called collinearity. The effect of collinearity is increased numerical instability, unstable parameter estimates and inflated standard errors. Collinearity can be distinguished from confounding by observing (when the predictor is fixed but covariate is changed) whether the outcome changes or not. If the outcome changes, the covariate is a confounder, if it remains unchanged, there is collinearity.

Interaction and testing for interaction

Interaction refers to a phenomenon where the response to one explanatory variable depends on the level of one or more explanatory variables. Interaction arises where the effect of one such explanatory variable depends on the particular level or value of the other explanatory variable (Fitzmaurice 2000; Fitzmaurice 2001). The interaction may be quantitative or qualitative in nature. If there is no interaction among explanatory variables, the effect of one is constant across all levels or values of the other (Fitzmaurice 2000). To test for interaction during regression analysis, one or more interaction terms are added from creating a product of the (two or more) explanatory variables. The original variables should be included in the model that contains their interaction terms.
Multivariate logistic regression analysis

Logistic regression is used when we have a categorical dependent variable and a number of numerical or categorical explanatory variables (Kleinbaum & Kupper 1978; Hosmer & Lemeshow 1989). For binary logistic regression, we predict the probability, \( p \), of classifying an individual into a particular category of outcome (Kelsey et al 1996; UCLA 2005) at the same time evaluating role of confounding and interaction. The logit of the probability is the natural logarithm (to base \( e \)) of the odds of disease:

\[
\text{logit}(p) = \ln \left( \frac{p}{1-p} \right).
\]

Logistic regression has advantage over linear regression in that it does not assume a linear relationship between dependent and independent variables, does not require the dependent variable or error terms to be Normally distributed, does not demand homogeneity of variances and does not need observations to be independent. An iterative process is used to produce a regression equation of the form

\[
\text{Logit } P = a + b_1x_1 + b_2x_2 + \ldots + b_kx_k.
\]

The exponential of a the regression coefficient (e.g. \( e^{b_1} \)) is the odds ratio, which is an estimate of the relative risk (RR) that is adjusted for confounding of all other variables (Hosmer & Lemeshow 2000).

Thus \( RR (x_i) = e^{b_i} \). Confidence limits of this estimate can be obtained using the coefficient and its standard error. Thus 95% CI = \( e^{(b_i \pm 1.96SE_{b_i})} \)

The computer output for logistic regression has the following information:

- The estimated logistic regression coefficient for each explanatory variable in the equation with its standard error;
- The estimated odds ratio and with the confidence interval of the estimate;
- The Wald test statistic (testing the null hypothesis that the relative risk of outcome associated with the variable is unity) and associated \( p \)-value

Assessing the adequacy or goodness of fit of the model (Lemenstrow & Hosmer 1982)

- The -2 log likelihood (LL) may be used indicates how poorly the model fits with all the explanatory variables in the model. A significant result (p-value less than 0.05) indicates poor prediction, as it is a test for \( H_0 \) that the model is not important. The change in LL may be used to calculate the deviance and thus compare different models for fit and appropriateness.
- The model Chi-square (Chi-square of the covariates). This tests the null hypothesis that all regression coefficients in the model are zero. A significant result indicates that at least one covariate is significantly associated with the dependent variable. It can be used to compare models with different covariates
  - Using a classification table to indicate the percentage of individuals correctly classified with outcome (`diseased’ or `disease-free’).

Model selection in regression analysis

As indicated in paper V and VI, the model selected should be sensible from a clinical standpoint. Inclusion of many explanatory variables may give spurious results. Explanatory variables must only be included if they are related to the outcome from a biological or clinical standpoint. Where feasible (as done in Paper V) stratified analysis should be done prior to performing multivariate analysis and presented in conjunction with the multivariate analysis (Hennekens and Buring 1987). Numerical variables and ordinal variables can be entered without modification or may be redefined and entered as a series of binary variables. In case there is modification of effect between the exposure and any potential modifier, a product term representing the combination between the exposure and modifier is added to
the model to assess for interaction (Kupper & Hogan 1978, Kahn 1983). This has been reported in Paper V.

Thus \( \ln \left( \frac{Y}{1-Y} \right) = a + b_1 x_1 + b_2 x_2 + b_3(x_1 x_2) + \ldots + b_n x_n \) where \( b_1, b_2, b_3 \) and \( b_n \) are the regression coefficients for each variable or combination of variables.

Increasing many explanatory variables leads to over-fitting the model. A model with as many variables as individuals is saturated. Increasing explanatory variables increases the fit but decreases the parsimony (simplicity) of the model, thereby limiting its clinical use in predicting outcomes. For logistic regression, it is the sensible significant model with the lowest -2 log likelihood. Since the -log likelihood has an approximate Chi-square distribution, the deviance Chi-square may be used for the model goodness of fit. A significant test indicates poor model selection a non-significant test indicates good model selection (Hosmer & Lemeshow 2000).

In summary, the following precautions (which were taken during studies that constitute this thesis) must be taken when carrying out multivariable analysis (Concato et al 1993):

1. Indicate the process and procedure of selecting and coding for covariates
2. The outcome variable should be numerical or categorical (and binary) for linear regression and logistic regression respectively.
3. The bivariate relationship between the covariates and the outcome variable must be independently evaluated prior to model fitting
4. The criteria for covariate selection during model building must be explicit
5. All biologically or clinically important variables should be evaluated during model selection, together with any significant variables on bivariate analysis
6. Assumptions for multivariable analysis must be checked, for example, conformity to linear relationship for linear regression
7. Interaction (effect modification) and collinearity must be assessed prior to or during logistic or linear model fitting
8. Model adequacy should be assessed

**Checking assumptions for multiple linear regression**

**Figure 1. Graph of studentized residuals of birth weight**
Figure 2: Box plot of studentized residuals of birth weight

Box plot of studentized residuals of birth weight

Figure 3: Q-Q plot of normalized residuals of birth weight
Figure 4: Plot of studentized residuals of birth weight versus fitted values
12.0 CONCLUSIONS
This study describes some of the contextual factors for domestic violence, especially during pregnancy. Bride price payment is a contextual factor that the community in Wakiso District, Uganda, perceived as associated with domestic violence, with serious sexual and reproductive health implications. Regarding factors associated with domestic violence, the community perceived pregnancy changes, poor conflict resolution mechanisms, and socio-economic changes to be associated with violence.

The changed gender roles and division of labour, changing cultural values and ignorance of pregnancy changes contribute to violence during pregnancy. Coping strategies adopted by pregnant adolescent survivors range from problem-focused approaches to emotion-focused approaches, and are markedly influenced by adolescence and pregnancy. The strategies are influenced by material and emotional resources as well as perceived severity of abuse, perceived danger to the survivor and perceived social support available. They therefore differed in their ability to limit violence. The social context and prior experiences markedly influence decision-making and therefore the chosen coping strategies.

Moderate to severe domestic violence is common during pregnancy and survivors are more likely to be adolescents than older women. Physical violence is often associated with psychological violence. Living in an extended family structure was associated with domestic violence. Domestic violence during pregnancy is associated with several pregnancy-related adverse outcomes.
- Domestic violence during pregnancy is a risk factor for unwanted pregnancy and induced abortion in Mulago hospital.
- Domestic violence is a key contextual factor in the decision-making process for pregnancy termination among women seeking postabortion care.
- In the pregnancy cohort, domestic violence during pregnancy was a risk factor for both low birth weight delivery and antepartum hospitalization for obstetric complications.
13.0 IMPLICATIONS OF THE RESEARCH

This study adds to available information on role of domestic violence in Sexual and Reproductive Health. The qualitative study provided data on bride price and its perceived implications for Sexual and Reproductive Health and Rights. It also explored community perceptions of violence, community experiences of violence and coping mechanisms for adolescent survivors. The quantitative studies highlighted risk factors for domestic violence as well as its pregnancy-related adverse effects.

To Sexual and Reproductive Health and Rights
This study highlights the burden of domestic violence in the sexual and reproductive health ill-health of women in Uganda. It also highlights the contextual factors associated with domestic violence. The study adds to the available evidence for the need to fully integrate gender issues into Sexual and Reproductive Health.

To healthcare providers
This research highlights the need for health care providers to acquire training in how to identify, provide optimal care and link domestic violence survivors with counseling and social support. This they can do by establishing screening as well as management for domestic violence survivors. Pregnancy provides a unique period for health workers to intervene as many women attend antenatal care in health units, even if this is only once in many cases. Many of the medical conditions seen in gynaecology are related to domestic violence, or gynaecological patients seek care for somatic symptoms, some of which may be related to domestic violence. Such patients provide a unique opportunity and require screening for domestic violence, as well as providing other support services and interventions that may enable them cope with domestic violence.

For policy makers
Eliminating domestic violence requires a multi-sectoral response, as it has wider implications beyond the healthcare system. Interventions should aim at changing the contextual factors and structural determinants of domestic violence. The interventions could involve health education campaigns, and strengthening the judicial and legal sectors in handling domestic violence cases. There is need to target the perpetrators of violence with suitable interventions. This also entails preventing violence by informing young men and boys in school and in communities as well as through media, about the consequences and of the equal value of women and men.
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