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Domestic violence and child health outcomes in Zimbabwe

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Abstract:

Background: This study intends to examine the association between domestic violence and selected negative child health outcomes in Zimbabwe. While studies have identified a number of factors affecting child health outcomes, the role of domestic violence has been neglected. Domestic violence, as a global public health concern, has been related to reproductive health outcomes, such as unwanted or unplanned pregnancy, lack of contraceptive use, preterm delivery and sexually transmitted diseases, including HIV/AIDS. In addition, the reduction of child mortality levels worldwide has become a prominent issue and is addressed as Goal 4 in the Millennium Development Goals. However, the possibility of domestic violence being related to the health outcomes of their children has not been explored in the African context.

Methods: This study is a secondary data analysis of the 2005/2006 Zimbabwe Demographic and Health Survey (ZDHS). The ZDHS has been chosen as it is representative of the country as a whole. The total sample of 2,152 women who participated in the Domestic Violence module of the ZDHS was used in this study. Thus the population of interest in this study is physically abused Zimbabwean women who have children. The outcome variables of this study are poor nutritional health outcomes, stunting, wasting and underweight and under-five child mortality. The predictor variables are physical violence experiences, including, domestic violence, being hit during pregnancy and sexual violence. The data analysis happened in three stages. The first being univariate analysis of the variables in this study, to provide descriptive statistics of the study population. The second stage was bivariate analysis producing odds ratios to examine the association between each of the predictor variables with each of the outcome variables. The final stage was multivariate analysis using logistic regression and producing odds rations to examine more than one predictor variable with each outcome variable to obtain an association.

Results: Associations were found between physical violence and the various negative child health outcomes. Of importance, domestic violence and being hit during pregnancy was found to increase the condition of wasting in under-five children. Similarly being hit during pregnancy is associated with increased odds of having underweight young children. Increased likelihood of the underweight condition is also associated with sexual violence experiences of the mother. However, sexual violence is not associated with stunting and / or wasting in under-five children.

The study finally found that domestic violence, being hit during pregnancy and sexual violence is associated with increased odds of child mortality occurring to the young children of abused women.

Conclusions: This study has shown, that in various settings, domestic violence is in fact a contributor to poor child health outcomes in Zimbabwe. Thus the health of under-five children cannot be separated from the life experiences of their mothers, who remain their primary caregivers. Traumatic experiences of the mother contribute negatively to the health of young children. Physically abused women are in fact less able to provide nutritional care, for varying lengths of time, for their offspring. In terms of the most adverse child health outcome, child mortality, the odds of this occurrence is exacerbated by experiences of domestic violence.

Chapter 1: Introduction.

1.1 Introduction and background:

Child mortality remains a documented problem in developing countries. In fact the magnitude of the problem has prompted a worldwide need for the reduction in child mortality. Thus it has been acknowledged that Millennium Development Goal number four is a need for the international reduction of child mortality to be achieved per state (WHO, 2006).

The child mortality rate in Zimbabwe was 129 per 1000 live births in 2004 (WHO, 2006). This rate is alarmingly high but not uncommon to Africa. This finding substantiates the importance of poverty and maternal education to promote positive child health outcomes in the developing regions (Asling-Monemi, et.al, 1999).

Zimbabwe's economic decline cannot be ignored in this regard, with escalating food prices translating into insufficient nutritional in-take (Banda, 2007). Stanford Matenda, a researcher and chairperson of the National University of Science and Technology's Journalism School in Bulawayo, argues that children do not have access to food and since parents are experiencing economic adversity it is difficult for children to be healthy (Banda, 2007). The country's economic problems have also affected the health delivery system (Banda, 2007). One government hospital records a stable rise in the number of under-five year olds dying of measles due to the lack of immunization in the rural areas (Banda, 2007).

A 1997 study highlighted the potentially explanatory factor of population density and spatial variation in understanding child mortality in Zimbabwe (Root, 1997:413). This study found that the Ndebele provinces of Matabeleland North and South have a child mortality level that is 45% lower than the other provinces in the country (Root, 1997: 413). It was found that this was not due to better healthcare services in the Ndebele provinces or due to cultural factors (Root, 1997: 420). It was found that population densities are of a lower order in the Ndebele regions and this affects how disease is transmitted and distributed (Root, 1997: 420).

Consistent with studies conducted elsewhere in Africa, it was found that the rural areas of Zimbabwe experienced higher under-five mortality rates than urban areas (Zimbabwe

Demographic and Health Survey, 2007: 113). The rural areas endure 72 deaths per 1,000 live births compared to the urban areas that experience 64 deaths per 1,000 live births (Zimbabwe Demographic and Health Survey, 2007: 113). In addition, mother's education presents a discrepancy in child survival rates with secondary education translating into lower mortality rates than children whose mothers have less education than that (Zimbabwe Demographic and Health Survey, 2007: 113). With regard to bio-demographic characteristics, male children have higher mortality than female children from the neonatal period and including the under-five age category (Zimbabwe Demographic and Health Survey, 2007: 113). Birth intervals are likewise significant with children born less than two years after a previous birth being more than twice as likely to die during infancy as those born more than two years after a previous birth (Zimbabwe Demographic and Health Survey, 2007: 114).

A study was conducted that measures the excess risk of child mortality in three African countries, Zimbabwe, Uganda and Burundi (McMurray, 1997). This study defined excess child mortality as mothers who exceeded their expected child mortality experience, on the basis of observed child's age, mother's age and parity, as well as had more than one child die (McMurray, 1997). In this study it was found that, without comparing observed experience with expected result, that Zimbabwe had the greatest concentration of child deaths as measured by a mother- to – child ratio (McMurray, 1997).

The importance of nutritional status is in its relationship to health status, particularly in young children. Poor nutritional status weakens the body's resistance to disease and illness (Wright, et.al, 2001). In addition, disease and illness reduces the body's ability to digest food which leads to possible weight loss and growth retardation in children (Wright, et.al, 2001).

There are three main influences on children's nutritional status, including, household food security, health environment and services and the level of care within the household (Wright, et.al, 2001). Various literatures have focused on household food security and health environment and services. However level care within the home remains scarcely researched. This study will focus on one possible level of household care, that of physically abused women's ability to care for their children.

A 2001 study, focusing on health environment and services, has found that there are significant seasonal variations in the underweight condition of under-five children in Zimbabwe (Wright, et.al, 2001). The study found that there is a small but significant increase in levels of underweight between the months of January and March annually (Wright, et.al, 2001). This period is arguably the season before harvest and has the greatest effect on higher prevalence of diarrhoea and malaria in the country (Wright, et.al, 2001). The study also found that there are no differences in the seasonality of underweight between districts (Wright, et.al, 2001). This suggests that there are no regions or districts that are better or worse with regard to experiencing seasonal underweight.

According to the Save the Children organisation, nearly one-third of Zimbabwean children are malnourished and the situation is reportedly deteriorating (Save the Children, 2008). In addition, according to the organisation, one in ten children in the country dies before their fifth birthday (Save the Children, 2008). This finding is substantiated by reports by UNICEF who argue that malnutrition levels in Harare have doubled over the past four years (IRIN, 2009). In particular there are high levels of severe acute malnutrition, or stunting in the capital that requires specific attention (IRIN, 2009).

This situation is the result of Zimbabwean children lacking access to basic health care and daily essentials for survival (Save the Children, 2008). That is, lack of household food security. Basic services and health care resources in the state have collapsed or are unattainable for many nationals and as such nutritional levels for the young are especially low (Save the Children, 2008).

In Zimbabwe, the Demographic and Health Survey in 2005/6 found that 29% of the children were stunted, 17% were underweight and 6% were wasted (Zimbabwe Demographic and Health Survey, 2007: 167). It was likewise found that malnutrition as indicated by these scores, increases until the children's 2nd birthday and decreases from there until their 5th birthday (Zimbabwe Demographic and Health Survey, 2007: 167). In addition, male children are somewhat more likely to be malnourished than female children (Zimbabwe Demographic and Health Survey, 2007: 167).

Domestic violence has been studied in various settings and it has been found that women who are physically abused are less able to regulate their fertility or access appropriate medical care when needed (Ahmed, et.al, 2006; Silverman, et.al, 2006). For the first time, the 2005-2006 Zimbabwe Demographic and Health Survey (ZDHS) has included a module on domestic violence. This particular module seeks to verify the extent of domestic violence experienced by Zimbabwean women (Zimbabwe Demographic and Health Survey, 2007: 259). The survey has shown that the percentage of women who had ever experienced physical violence since the age of 15 and including women who experienced physical violence in the last 12 months is 40.3 for a total of 1,467 women aged 20-24 years old and 38.3 for a total of 1,023 women aged 25-29 years old (Zimbabwe Demographic and Health Survey, 2007: 259). Thus it shows that there is a prevalence of domestic violence in Zimbabwe. However, domestic violence has not been identified as an important variable in child health studies in Zimbabwe.

1.2 Problem Statement:

Having noted these two fundamental health concerns, child mortality, child health and domestic abuse, it is important to note that little attention has been paid to the relationship between these occurrences in developing countries. That is, questions arise such as, if abused women are unable to care for themselves, what impact does the abuse have on their off-spring? It is here suspected that this there is in fact an impact on the health and mortality of children of abused women.

1.3 Research question*:*

- Is there an association between domestic violence and child health outcomes in Zimbabwe?

1.3 Research Objectives:

1.3.1 General objective:

- To examine the relationship between domestic violence and negative child health outcomes in Zimbabwe.

1.3.2 Specific objectives:

- To examine the levels and patterns of domestic violence in Zimbabwe.
- To examine the levels and patterns of negative child health outcomes in Zimbabwe.
- To examine the relationship between domestic violence and child health outcomes in Zimbabwe.

1.4 Justification:

A study of 966 women in a Zimbabwean province found that 32% of them had been physically abused by a household or family member (UNICEF, 2000:5). National studies on violence against women in Zimbabwe have demonstrated regional, urban and rural, and socioeconomic factor fluctuations (WHO, 2008). For example, it was found that more rural women have ever experienced physical abuse than urban women (Zimbabwe Demographic and Health Survey, 2007: 261). In addition, Zimbabwean women who are employed but do not receive their salary in cash have higher reported abuse since the age of 15 than women who are not employed or receive cash payments for their work (Zimbabwe Demographic and Health Survey, 2007: 260). There is also a higher percentage of women living with three or four children having experienced physical violence since age 15 than women with less than three or no children at all (Zimbabwe Demographic and Health Survey, 2007: 261). With regard to child mortality in Zimbabwe, the Demographic and Health Survey reports that in the five-year period prior to the 2005-2006 survey, one out of every twelve children died before reaching their fifth birthday (Zimbabwe Demographic and Health Survey, 2007: 110). Within this, around three-quarters of deaths

occurred during the infant or first year of life (Zimbabwe Demographic and Health Survey, 2007: 110). Overall the Demographic and Health Survey found that the mortality levels of children under five years old had declined in the 1980's, remained relatively stable in the 1990's and started to increase in the late-1990's (Zimbabwe Demographic and Health Survey, 2007: 111).

The United Nations General Assembly (2006) argues that neglect is a contribution to child mortality and morbidity (UNGA, 2006: 13). In addition the United Nations General Assembly acknowledges that neglect includes the failure to obtain medical and other services when required (UNGA, 2006: 13). This is significant as neglect has a negative impact on child survival. Related to child survival is the point that the reduction of child mortality worldwide has been identified as the fourth Millennium Development Goal. This is a clear indication of the severity of the issue and the need for research and implementable action in order to eradicate this problem from all societies, especially that of developing nations.

The United Nations (UN) recorded that, annually, between 133 and 275 million children worldwide have observed domestic violence (UNGA, 2006:14). The World Health Organization (WHO) acknowledges that domestic violence has, in the past, been considered as a slight social problem in many countries (WHO, 2008). This situation is changing due to the role of women's organizations and research findings (WHO, 2008). Currently, domestic violence is being recognised as a global problem that is related to social conditions such as gender inequality, poverty and child mortality (WHO, 2008). Studies in China, Egypt, Mexico and South Africa, among others, have found that domestic violence increases the risk of violence against children (United Nations, 2006: 14). In this context it becomes evident that the consequences of domestic violence are vast. That is, not only is there evidence of harm to women but also evidence of harm to children.

It is evident at this point that child mortality and domestic violence are both, in very distinct ways, social problems that require attention and action. There have been many studies of these crises as independent outcomes of socioeconomic and political processes and occurrences. However, to my knowledge there have not been any studies conducted in Africa on the

relationship between these two crises. That is, as separate social anomalies domestic violence and child mortality has been studied in the African context, but studies attempting to exemplify a relationship between the possible influence of domestic violence on not only child mortality but other negative child health outcomes have not been conducted in African states.

This study does not ignore the discourse that contends that domestic violence is embedded in social and ethnic cultures. That is, through understanding that gender inequity and the subsequent occurrence of domestic violence are in some way culturally propagated or determined, it becomes evident that domestic violence is not a haphazard phenomenon. In this way, it becomes clear that there are some societies or even sub-cultures that inhibit more domestic violence than others. Thus making the context in which domestic violence happens, a fundamental explanatory tool for analysis. However, the focal point of this study is not the social, economic or socio-demographic attributes of domestic violence. That is, this study is not concerned with why or under what circumstances domestic violence occurs, it is concerned with the way in which domestic violence, as an independent variable, impact on the outcome of child health issues in Zimbabwe. Therefore, this study will acknowledge the cultural, social and other determinants of domestic violence in the literature review and provide descriptive statistics of these attributes but it will not become an objective for this study to encapsulate.

This research will hopefully fill in this important gap in research and in doing so will contribute to the body of knowledge that aids in achieving the Millennium Development Goal that addresses the reduction of child mortality. That is, the research implication for this study is that it provides significant basis for studies of this nature to be conducted in African countries. This study will identify the significant levels and patterns of domestic violence and negative child health outcomes in the state of Zimbabwe. In addition, and overall, this study, through examining the relationship between domestic violence and negative child health outcomes will substantiate the need for further research in Africa. This study will also substantiate the importance of the Millennium Development Goal number four.

1.5 Definition of terms:

1.5.1 *Domestic Violence:* This is any act of physical violence against women by their intimate partner. In this research, it will be used as a synonym for gender-based violence and violence against women.

1.5.2 *Child Health Outcomes:* This study is concerned with the negative health outcomes of children under – five years old. It includes nutritional deficiencies such as wasting, stunting and underweight, as well as mortality.

1.5.3 *Under-five Mortality:* This refers to deaths of children under- five years old.

Chapter 2: Literature Review and Conceptual Framework.

2.1 Literature review.

2.1.1 Child mortality:

Hill and Pebley (1989) reviewed the trends, levels and age patterns of child mortality in developing countries from the 1960's to the 1980's and were able to draw some significant conclusions (Hill and Pebley, 1989: 680). To begin they found that over time child morality between regions and states were very different and the differences had widened (Hill and Pebley, 1989: 680). Secondly the rate of child mortality decline in Africa is slower than that of Asia, the Americas and the Middle East (Hill and Pebley, 1989: 680). The study found that this was associated with Africa having a higher initial child mortality rate than in other regions of the world (Hill and Pebley, 1989: 680). Another finding was that changes in economic policies and the introduction of structural adjustment programmes would take a while to bring about apparent changes in child mortality levels on the continent (Hill and Pebley, 1989: 681).

Of key concern in literature is the occurrence of infant mortality. The World Bank in 1998 adopted the infant mortality rate (IMR) as a social indicator for development in that it represents a loss of human resource and potential that has both economic and social consequences (World Bank, 1998).

Reductions in infant mortality and child mortality rates are achievable. A study conducted in Senegal over a period of thirty-seven years found that this West African state had in fact experienced a substantial decline in infant and child mortality rates (Delaunay, et.al: 2001:1286). The study found that in rural areas of Senegal infant mortality rates decreased from 223‰ or 223 per 1,000 to 80‰, or 80 per 1,000 in the period of 1963-1999 (Delaunay, et.al: 2001:1286). Similarly, under-five mortality decreased from 485‰ to 213‰ in the same period (Delaunay, et.al: 2001:1286). It was found that urban declines in infant and under-five mortality rates started earlier than in rural areas (Delaunay, et.al: 2001:1286). The time or date of the decline was reliant on the rural area's distance from the capital city Dakar and on the healthcare system (Delaunay, et.al: 2001:1286). In one particular region, Niakhar, the study found that mortality due to HIV and AIDS was low due to low prevalence in the region (Delaunay, et.al: 2001:1291).

Later changes in fertility behaviour such as birth spacing and breastfeeding contributed to the decline in mortality (Delaunay, et.al: 2001:1291). Thus it is recommended that changes in fertility behaviour, access to family planning and increased coverage of immunization be promoted in Senegal to see sustainable child mortality reductions (Delaunay, et.al: 2001:1291).

An alternative study on child mortality has examined the effects of family on child survival (Sear, et.al, 2002). This study employed multilevel event-history models and found that children living with a female family member had a significant positive effect on survival probabilities compared to living with a male member which had no effect (Sear, et.al, 2002: 43). Also children in the first two years of life who had a deceased mother were at 5-6 times greater odds of dying than children whose mothers were still alive (Sear, et.al, 2002: 55). However, the death of the father in the family had no effect on child mortality at any age of the child (Sear, et.al, 2002: 55). In addition it was found that a mother's remarriage proved "harmful" to the child (Sear, et.al, 2002: 58). That is, either the child being left without the mother and in their father's care or the child relocating to the new husband's home had a negative effect on child survival (Sear, et.al, 2002: 58).

2.1.2 Child mortality in Zimbabwe:

The WHO (2006) has reported that the probability of dying under- five years old in Zimbabwe was 129 per 1000 live births in 2004 (WHO, 2006). In addition, the infant mortality rate for the same year was 78 per 1000 live births (WHO, 2006). It was also found that the prevalent cause of death among children under-five years old in 2000 was neonatal causes, with 28.1% of deaths attributable to this (WHO, 2006).

UNICEF (2005) reported that despite Zimbabwe having the highest increase in child mortality of any nation, the state receives far less funding compared to other African states (UNICEF, 2005). In addition and particularly due to the state's high prevalence of HIV/AIDS, the under-five mortality rate has increased by 50% since 1990 (UNICEF, 2005). With neonatal causes contributing the most to the neonatal mortality rate, or death within the first 28 days of life, in Zimbabwe, it is worth noting that this form of mortality is largely attributed to endogenous factors (UNGA, 2006). That is factors resulting from the birth process or the gestational period. The most common of these factors or causes are that of low birth weight or preterm delivery (Asling- Monemi, et.al, 1999). In addition to child mortality, child health in Zimbabwe has

deteriorated in the period of 1999 to 2005 (WHO, 2006). With this finding it is easy to substantiate the finding that child mortality has increased in the region over the same period.

The factors identified that contribute to child mortality in Zimbabwe include mother's education (McMurray, 1997) and environmental risk factors such as urban and rural water sources and sanitation (WHO, 2006). The possibility of domestic violence being a contributing factor in Zimbabwe and other African states has not been investigated.

2.1.3 Child Mortality Policy and initiatives:

In 2000 the United Nations (UN) developed and pronounced the Millennium Development Goals (MDGs) (WHO, 2008). The overall aim of the MDGs is to ensure the development of all states during the first fifteen years of the new millennium (Okonofua, 2005: 7). There are eight goals of development among which MDG 4 clearly addresses the need for reduction in child mortality rates worldwide (WHO, 2008). Concurrent with the goals there are eighteen targets and forty-eight monitoring indicators to measure the performance of each state (Okonofua, 2005: 7).

It is argued that Africa and in particular Sub-Saharan Africa has the most to gain from achieving the goals but also faces the most problems in doing so (Okonofua, 2006: 7). The UN approximations show as many as 4.8 million under-five children die in Sub-Saharan Africa every year (United Nations Statistics Division, 2005). Furthermore, Sub-Saharan Africa is the only region where child mortality rates have increased instead of decreased (Okonofua, 2006: 8). The problem in Africa is so severe that states with the highest child mortality levels, such as the Democratic Republic of Congo, Ethiopia and Tanzania are expected to miss the MDG targets by greater than thirty-five years (Okonofua, 2005: 8). This situation is exacerbated by the large proportions of people infected by HIV, as well as the spread of malaria and TB across the continent (Okonofua, 2006: 8).

Zimbabwe's target for under-five mortality is to obtain a child mortality rate of 42 per 1000 live births by the year 2015 (WHO, 2006). However, with an increase from 117 per 1000 live births in 2000 to 129 per 1000 live births in 2004 it does not appear likely that this target will be met.

The MDGs aside, the UN has implemented other initiatives and policies to protect the interests of children worldwide, such as the United Nations Children Fund (UNICEF) and the United Nations General Assembly (UNGA) agenda for the promotion and protection of children.

UNGA reports in 2006 highlighted and elaborated on every right that children are entitled to globally (UNGA, 2006). The report details the problems children face including violence, humiliating punishment, sexual abuse and homicide (UNGA, 2006: 8). In addition, the UNGA found that one of the settings in which violence against children occurs is in the home (UNGA, 2006: 12). Furthermore the perpetrators vary according to the age and maturity of the children (UNGA, 2006: 13). In the case of young children, some violence can cause permanent damage or death without the perpetrator intending to do so, such as in the case of "shaken baby syndrome" (UNGA, 2006: 13). Related to this is the issue of neglect that the UNGA notes as including "a failure to meet children's physical and emotional needs, protect them from danger, or obtain medical or other services when needed" (UNGA, 2006: 13). This is significant because neglect contributes to the morbidity and mortality of young children (UNGA, 2006: 13).

2.1.4 Domestic Violence:

The topic of domestic violence is not unique to any single, specific society. It is a universal problem and public health concern. Literature contends that domestic violence and in particular violence against women, stems from embedded gender inequality in culture and societies. Domestic violence is a form of violence against women by an intimate partner, whether it is a husband or cohabiting partner (UNICEF, 2000: 2). Thus the word 'domestic' refers to the nature of the relationship between a woman and her partner and not the physical place where the violence takes place (UNICEF, 2000: 2). This clarity is important because the issue of domestic violence does not encompass violence against women by strangers or men who are in no way related to the victim (UNICEF, 2000: 2).

A study of 9,033 abused women in Algeria found that more than half the women were abused at home (Institut Nationale de Sante Publique, 2005: 50). Two- thirds of the women were married and more than half had secondary or tertiary education (Institut Nationale de Sante Publique, 2005: 50).

2.1.5 Domestic violence and reproductive health:

With regard to physical violence, rape that results in unwanted or unplanned pregnancy is of concern to the developing world, including Sub-Saharan Africa (Ahmed, Stephenson, Koenig, 2006: 75). A number of studies have been done regarding domestic violence and its various health outcomes for women. One study in India found that there was less of a likelihood of a

woman adopting contraceptive means if she is or has been physically abused by a partner (Ahmed, Stephenson, Koenig, 2006: 84). Another study has found that in Colombia there is a moderate relationship between unplanned pregnancy and violence from an intimate partner (Pallitto, O'Campo, 2004: 169). Thus these health consequences of domestic violence, and others, are not receiving the attention that it deserves as many states still view domestic violence as human rights or legal issue and do not see the important health and development implications that it has (Watts and Mayhew, 2004:207).

Of particular significance to this is the relationship between domestic violence and pregnancy. Studies have shown that pregnant women are at a higher vulnerability to abuse (Puwar, et, al. 1999). Experiencing violence while being pregnant has implication for whether or not the pregnancy will result in a live birth or not (Zimbabwe Demographic and Health Survey, 2007: 267).

The fore mentioned findings prove that violence against women who are pregnant is not only happening but is a problem. Clearly there is an effect on maternal health, morbidity and mortality as seen in these studies and others (Silverman, et.al, 2006 and Winn, et.al, 2003).

2.1.6 Domestic violence and under-five child mortality:

With regard to domestic violence and child mortality there are only a few studies that have been identified. A study conducted in Nicaragua shows that children born into abusive relationships (male- to – female violence) are six times more likely than children not born into these relationships to die before the age of five years old (Asling – Monemi, et.al, 1999: 11). The study found that 84% of the 110 deaths of children between 1993 and 1996 were in the first year of life (Asling – Monemi, et.al, 1999: 12). The most common cause of death between ages 1 and 5 was infectious diseases including and mainly diarrhoea (Asling – Monemi, et.al, 1999: 12). A significant association was found between lifetime experiences of any kind of violence toward the mother and the mortality of their children (Asling – Monemi, et.al, 1999: 12). Furthermore, no formal education of the mother, multi-parity and rural residence were associated with increased infant and under-five mortality (Asling – Monemi, et.al, 1999: 12). However no association was found between socioeconomic status and infant, or under-five, mortality in the country (Asling – Monemi, et.al, 1999: 12). After adjusting for education, place of residence and

parity, it was found that the risk of under-five mortality was more than six times more likely if the mother had been exposed to physical violence (Asling – Monemi, et.al, 1999: 12).

Finally, trauma as a cause of death for under-five children should not be ignored as a part of this relationship (Asling – Monemi, et.al, 1999: 14). That is, child abuse, in addition to and sometimes a part of domestic violence remains underreported in many instances but should not be over-looked especially since it was found that children of abused mothers are almost 7 times more likely to be physically and sexually abused than children from non-abusive households (Ellsberg, et.al,2000: 1609). In conclusion, Asling-Monemi and others argue that the type of violence and its severity is more important to the risk of child death than the timing of abuse, that is, prior, during or following pregnancy (Asling – Monemi, et.al, 1999: 14). This is despite criticism by Butchart and Villaveces (2003) who argue that data on child abuse and intention or wantedness of pregnancy would have aided in better understanding the relationship between domestic violence and child mortality (Butchart and Villaveces, 2003: 17).

2.1.7 Child Nutrition:

Anthropometric indicators are the standard by which the nutritional health status of children is measured (WHO Working Group, 1986: 929). It has been identified that most growth deficits in children in developing countries is caused by infection and inadequate food intake (WHO Working Group, 1986: 929). In 1977 a report was released whereby it was proposed that the basic data used for anthropometric indices be age, sex, weight and height (WHO Working Group, 1986: 930). In addition to this suggestion, it was proposed that the measurements be represented by standard deviation scores (z-scores) and that data on children be offered as separate age-groups (WHO Working Group, 1986: 930).

There are a number of measurements used. The basic measurements are age, weight and height (WHO Working Group, 1986: 930). Mid-arm circumference and head circumference are alternatives for weight and height and skinfold thickness gives information about body composition (WHO Working Group, 1986: 930). The use of weight and height in anthropometry has biological significance and in addition to age encompasses the basic measurements of child nutrition (WHO Working Group, 1986: 930).

There are three specific outcomes related to these measurements, namely wasting, stunting and underweight. Wasting is a condition that indicates a deficit in fat mass and tissue in comparison to the standard or expected fat mass and tissue of children (WHO Working Group, 1986: 931). Thus wasting is directly related to weight gain or loss in children (WHO Working Group, 1986: 931). Weight gain or loss is dependent on food availability and intake, thus wasting could be a temporary condition or seasonal depending on food supply (WHO Working Group, 1986: 931). Stunting is a condition that suggests slow bone growth in children (WHO Working Group, 1986: 931). This condition is measured by the height- for- age scores for children and is found to be associated with poor overall economic conditions, infection and insufficient food intake (WHO Working Group, 1986: 931). The condition of being underweight is measured by comparing a child's weight- for- height score with a standard score of what it is meant to be at a particular height (WHO Working Group, 1986: 932).

In a study of six Sub-Saharan African countries, it was found that a quarter of all children aged 1-35 months in Malawi in 1992, Zambia in 1992, Ghana in 1993, Nigeria in 1990 and Tanzania in 1991/2 were stunted (Madise, et.al, 1999: 335). The same study found that the weight –for-age scores, which indicates wasting, deteriorated for children after their birth and until their 2nd birthday, thereafter it stabilized (Madise, et.al, 1999: 335). This was found to be true of height-for- age scores as well as weight-for-height scores (Madise, et.al, 1999: 335). In Zimbabwe, the Demographic and Health Survey in 2005/6 found that 29% of the children were stunted, 17% were underweight and 6% were wasted (Zimbabwe Demographic and Health Survey, 2007: 167). It was likewise found that malnutrition as indicated by these scores, increases until the children's 2nd birthday and decreases from there until their 5th birthday (Zimbabwe Demographic and Health Survey, 2007: 167). In addition, male children are somewhat more likely to be malnourished than female children (Zimbabwe Demographic and Health Survey, 2007: 167).

2.2 Conceptual and theoretical framework

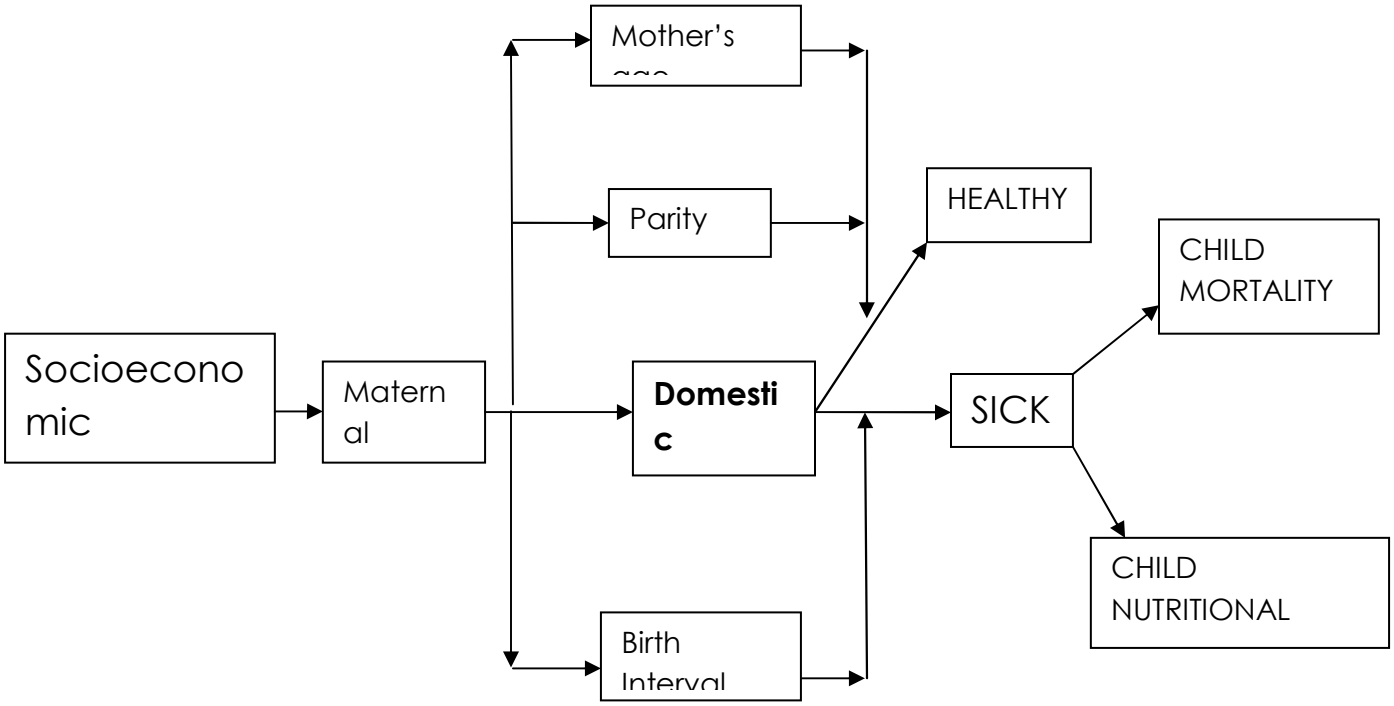
This study will be based on the on the framework for child health and mortality by Mosley and Chen (1984). Mosley and Chen acknowledge that child mortality and morbidity are influenced by underlying factors, both socio-economic and biological that operates through proximate determinants (Mosley and Chen, 1984: 27). According to Mosley and Chen, a key feature of child survival is the existing collection of proximate determinants that directly persuade morbidity and mortality risks among children (Mosley and Chen, 1984: 27). Among these determinants is that of maternal factors (Mosley and Chen, 1984: 27). In this way, factors such as domestic violence, would have a detrimental effect on the maternal health of women and thus impact or influence child survival.

This study will make an amendment to Mosley and Chen's framework. The maternal factors identified in the 1984 framework are that of mother's age, parity and birth interval (Mosley and Chen, 1984:32). This is of course important to child survival studies; however this study proposes that domestic violence be incorporated as a maternal factor that influences child morbidity and mortality.

Mosley and Chen (1984) acknowledge the importance of other distal factors such as social relations, human and environmental hazards and geographic factors as well as other socioeconomic factors such as injury, nutrient deficiency and personal illness control. However this study will focus exclusively on the socioeconomic condition of maternal factors, and in particular, domestic violence, and all other factors will be assumed to be constant in Zimbabwe.

Thus since nature of this research is to evaluate the impact of domestic violence on child survival, it is important to examine possible means and avenues of adapting existing frameworks to incorporate domestic violence variables. It is thus here suggested that the Mosley and Chen framework be adapted to include domestic violence as an important maternal factor in determining child health outcomes.

Figure 1. Adapted Framework for the study of domestic violence and child health outcomes: (Mosley and Chen, 1984)



2.3 Conclusion

The literature discussed in this chapter displays research on the topics of child mortality, child health and domestic violence as independent areas of study.

Generally, studies concerning child mortality have explored trends, levels, age patterns and contributory factors. Such factors including household composition, shows that contributors to child mortality are explainable at a demographic level, such as whether or not there is a female living with the children (Sear, et.al, 2002). Specific to Zimbabwe, studies have shown that child mortality is largely attributed to endogenous factors (UNGA, 2006). This proves that child mortality is related to their mother's health and well-being. As a result of findings such as these, as among others, policy and initiatives have become increasingly important and prominent

worldwide. For example the Millennium Development Goals have specifically addressed the need for an international reduction in child mortality (WHO, 2008).

Domestic violence literature shows that there is a prevalence of physical violence worldwide (Institut Nationale de Sante Publique, 2005; Pallitto, O'Campo, 2004 and UNICEF, 2000). The literature also shows that the area of domestic violence and reproductive health has been addressed. In particular, Ahmed, et.al (2006) found that unwanted pregnancy and the inability to adopt contraception are both associated with physical violence experiences.

The literature was able to identify a study that addresses the relationship between child mortality and domestic violence. The study, by Asling – Monemi and others (1999), is of particular importance to this study as it addresses child survival in the context of physical violence experiences of the mother. In addition, similar to this study, Asling – Monemi and others (1999) did not address the impact or occurrence of child abuse as a possible cause of death.

Explanation of child nutrition indicators is also offered in this chapter. The three malnutrition indicators of stunting, wasting and underweight are elaborated on for its significance as child health measures. From these indicators, studies have shown that malnutrition is a problem in the developing world (Madise, et.al, 1999 and Zimbabwe Demographic and Health Survey, 2007).

The conceptual and theoretical framework attempts to contextualise the relationship between maternal factors and poor child health outcomes. Mosley and Chen (1984) developed a framework for understanding this relationship but have not included domestic violence as a possible factor. Hence, given the segregation of the literature and the accuracy of the existing framework, it is the suggestion of this study that domestic violence be included to the Mosley and Chen (1984) framework and provides additional research that incorporates these autonomous variables.

Chapter 3: Methodology.

3.1. Introduction:

This chapter discusses the methodology of this study. Reference is made to the data source, study population and variables used in the analysis.

3.2 Study Design:

The study is a secondary data analysis of the 2005/2006 Zimbabwe Demographic and Health Survey (ZDHS) datasets of abused women and children who are under-five years old. The ZDHS has been chosen as it is representative of the country as a whole.

3.2.1 The 2005/2006 ZDHS

The 2005-2006 ZDHS is one of a series of surveys undertaken by the Central Statistics Office (CSO) as a part of the Zimbabwe National Household Survey Capability Programme (ZNHSCP) and the worldwide measure DHS Program. Financial aid for the 2005-2006 ZDHS was provided by the national government , the United State Agency for International Development (USAID)and the US Presidents Emergency Plans for Aids Relief (PEPFAR) among other international organisations. Zimbabwe was stratified by its 10 Provinces (Manicaland, Mashonaland Central, Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South, Midlands, Masvingo, Harare and Bulawayo). The sampling frame employed was the 2002 Zimbabwe Master Sample (ZMS02) developed after the 2002 population census by the CSO.

Each of the provinces, except Bulawayo and Harare, were divided into four strata according to the land use (commercial, large-scale commercial farming, urban and semi-urban areas and resettlement areas). For Harare and Bulawayo only urban stratum was formed. Thus there was the total of 34 strata. In total there were 1 200 enumerations areas selected with the probability proportional to the size (PSS), the size being the number of households enumerated in the 2002 census. The selection of enumeration areas was a systematic, one – stage operation carried out independently for each of the 34 strata. A total of 10800 households were selected.

3.2.2 Study population

The population of interest in this study is abused Zimbabwean women who have children. To be more precise, the study includes Zimbabwean women interviewed for the domestic violence module, who have children that, at the time of the interview, were under- five years old. Furthermore these women were either formally married or in a cohabiting relationship at the time of the interview process. The marital status of these women will not be regarded as important inclusion criteria for this study as domestic violence does not only occur in marital unions. Thus, women who are married as well as those considered to be in heterosexual relationships will be used in the analyses.

The study is however, restricted to women in the sample who have experienced only physical violence. That is, the occurrences of emotional or verbal abuse and sexual abuse will not be included in this study. The reason for this is that although it is not doubted that the latter forms of abuse cause health and psychological problems for the abused women, it is not the purpose of this study to research the effects of abuse on women. The focus of this research is to study the effects of domestic violence on the health outcomes of children and the only way in which it is possible to do so with the available data, is to use physical forms of violence on women by their intimate partners.

3.2.3 Sample Size

The sample used in this study is all women who were selected and participated in the Domestic Violence module of the ZDHS questionnaire. A total of 2,152 women participated in this module and all these women have been included in this study, although not all experiences were of physical violence. Those pertaining to emotional or any abuse other than physical were screened and dropped. In addition, the children of these women were included in this study. The children were identified through matching the “caseid” numbers in the women’s questionnaire, with those in the household data set, where the children’s information was identified. A third data set, the Child Nutrition data set specifically compiled using WHO reference population standards, was then used to add child nutrition data to the sample. The nutritional information of the children of the respondents was matched using “hwhhid” numbers and the “caseid” numbers of the respondents. Through matching the observations in this way, it is ensured that only the relevant

respondents, those who participated in the module and their offspring, constituted the sample of this study. Thus a sample of 2, 634 under-five children were identified for this sample.

3.2.4 Questionnaire design

The ZDHS made use of 3 separate questionnaires: a household questionnaire, a women's questionnaire and a man's questionnaire. These questionnaires are an adaptation of the DHS Model questionnaire which consist of 2 models and aimed to reflect the population and health issues that are relevant to the country. In addition, there were three language variations of the questionnaires: Shona, Ndebele and English.

The household questionnaire collected some basic information on the characteristics of each person listed, including age, sex and survival status of children under-18 years old. This questionnaire also recorded the height, weight and haemoglobin measurements for children under 5 years old. This latter information was then used to produce the Child Nutrition data set that uses anthropometric measures according to the predefined WHO standards.

The women's questionnaire was used to collect information from all women aged 15–49 years. Some of the topics asked were background characteristics, including education and residential history, medical care (antenatal, delivery and postnatal) and domestic violence experience.

In this study, the household questionnaire provided information concerning births, deaths and nutritional status of under five-children in order to determine child health outcomes. The women's questionnaire provided information concerning the socioeconomic, demographic and domestic violence characteristics of the respondents in order to determine predictor factors of poor health outcomes.

3.2.5 Training and Field Work

In April, CSO staff and a variety of professionals from non-governmental organisations, donor organisations and government ministries participated in a three-day training of trainer's course. The first pre-test of the survey was conducted in Gweru and surrounding areas by 16 qualified practitioners and included approximately 200 households. Following this there was a debriefing session in order to modify the questionnaires according to the results and feedback of the pre-test.

Training for the interviewers took place in mid 2005 and 130 field worker interviewer trainees underwent a 4-week guidance period. Most of the field workers were trained nurses or Advanced-Level graduates. The trainees, whose performance during the training course was satisfactory, were selected as interviewers and the remainder were assigned to office operations.

Data collection for the ZDHS took place over a seven-month period, from August 2005 to February 2006. There were fourteen interviewing teams in total.

3.2.6 Data processing

All questionnaires were returned to the CSO for processing. The first stage of the data processing consisted of office editing, coding of open-ended questions and data entry. The second stage was secondary editing of computer identified errors which comprised of checking and resolving inconsistencies in the data as identified by the editing programme, which was the software package CSPro.

The data was processed in two shifts by 21 data entry clerks, 2 data editors and 2 data entry supervisors. To maximise the quality of the data and reduce the secondary editing process, there was 100% verification (re-entry) of all questionnaires. The final data cleaning was completed in May 2006 and preliminary results were then generated from the imputed raw data.

3.3 Variables used in the data analysis

3.3.1 Variable Definitions:

The dependent variable that is the variable that is suspected to be influenced by domestic violence, of this study is negative child health outcomes. These outcomes include:

- Under – five mortality: this is death anytime between birth and five years of age. That is, 0 – 5 years old. It includes infant mortality.
- Child Nutritional Status: This involves the use of anthropometric indicators, which is the basic measure of the age, height and weight of children. Three anthropometric indicators will be used and measured as standard scores (z-scores):
    - Stunting: This indicates past or chronic under-nutrition.

- Wasting: This indicates current or acute under-nutrition.
- Underweight: This is a composite index of both of the above.

3.3.2 Independent variables:

The background characteristics in Table 1, includes all variables that provide a better demographic background of the women who participated in this module. The variable of race or ethnicity was not collected in the survey and is thus excluded in this analysis.

Table 1 shows all the predictor variables that will be used in this study. The variables are segregated into socioeconomic characteristics, demographic characteristics and physical violence characteristics.

The variables “age of the respondent at first birth”, “highest education level”, “occupation” and “type of residence” is used as indicators of socio-economic status. That is, women who were teenagers at first birth, rural residence, little or no education and unskilled manual labour are considered as indicators of low socio-economic status.

The variable “age of the respondent” is demographic indicator included as an explanatory variable. This variable aids in describing the sample of women who participated in the study.

The variable “marital status” refers to the type of domestic relationship that the respondent is in. With regard to region, Zimbabwe’s ten provinces were grouped into seven regions or provinces. In particular, the three Mashonaland provinces (Mashonaland Central, Mashonaland East and Mashonaland West) were grouped into the single category of “Mashonaland”. Likewise, the two regions of Matabeleland (Matabeleland North and Matabeleland South) were also combined to form one variable.

The variable “number of household members” refers to the number of individuals residing in the home of the resident at the time of the interview and is useful in this analysis as it indicates among how many individuals’ resources are being shared. The Zimbabwe Demographic and Health Survey (2007) found that the average household size in the 2005 -2006 period was 4.6 members (Zimbabwe Demographic and Health Survey, 2007: 11). For this reason the variable of “number of household members” has been split into households with less than five members, “<5”, and households with more than five members, indicated by the category “>5”.

The "Religion" variable was comprised of three categories. The Roman Catholic faith is by far the predominant religion in Zimbabwe with an approximate 1,110,000 Zimbabweans being of this faith (International Religious Freedom Report, 2005). All other Christian denominations were combined with members of traditional, Muslim and other faiths, as well as respondents who answered that they have no religious affiliation to form the "Other" category.

Table 1. **Variables used and their definitions.**

Variables:	**Definition:**
Socioeconomic: Age of the respondent at first birth	 < 19 years old > 19 years old
Highest educational level	No education Primary Secondary
Occupation	Not working Working
Type of residence	Urban Rural
Demographic: Age of the respondent	 <27 years old >27 years old
Marital Status	Married Living together
Number of household members	<5 >5
Region	Manicaland Mashonaland Matebeleland Midlands Masvingo Harare Bulawayo
Religion	Roman catholic Other
Physical Violence: Domestic Violence	 Spouse ever pushed, shook or thrown something Spouse ever slapped Spouse ever punched Spouse ever attempt to strangle or burn Spouse ever attacked with a knife, gun or other weapon.
Hit during pregnancy	No Yes
Physically forced sex when not wanted	 No Yes

Table 1 also displays the domestic violence variable. This variable was created to incorporate 5 types of physical violence perpetrated by spouses. The different types of physical violence were extracted from the 2005-2006 ZDHS Domestic Violence module.

The respondent's answers to these questions have been coded into binary (yes or no) variables. That is, the respondents who, in the questionnaire, answered "no" and "not at all" were coded as "No" and those who answered "sometimes" and "often" were coded as "Yes". This was then merged into the one variable, "Domestic Violence".

The next variable was if the respondent was ever hit during pregnancy by her spouse. The variable "hit during pregnancy" is included in this research because firstly, it would affect the endogenous development of the foetus as well as the neonatal survival of the child. Secondly it establishes a course of experience or a personal record of history of violence for the respondents.

The last physical violence variable is related to physically being forced to have sexual intercourse by a husband when not wanted.

3.3.3 Dependent variables:

There are two main outcome variables, whether the respondent's child is alive or not and whether the respondent's child is considered healthy or not. The children of interest in this section are firstly children of the respondents only and secondly are five years old or younger. The data for the malnutrition indicators of stunting, wasting and underweight, were collected from the ZDHS 2005- 2006, where independent analysis of these indicators was already conducted according to the WHO Reference Population, by the ZDHS. This analysis was done on a sample of 5,353 under-five children in Zimbabwe. However for this study only the children of the respondents were isolated and used. However, for this analysis only 1,793 under-five children have been used.

Table 2 Child health outcomes including malnutrition and mortality variables

Variables:	**Definition:**
Stunting	Not Stunted Stunted
Wasting	Not Wasted Wasted
Underweight	Not Underweight Underweight
Child Survival	Alive (yes) Dead (no)

The variable "Stunting" refers to the anthropometric indicator of height-for-age that is a measure of linear growth in under-five year old children. If children do not meet the standard or reference score for this measure they are considered to be stunted which reflects a cumulative effect of chronic malnutrition. If a child has a Z-score of below -2 standard deviations from the median reference population they are considered stunted.

The variable "Wasting" refers to the anthropometric indicator of weight-for-height that is a measure of the current nutritional status of under-five children. Z-scores that are below -2 standard deviations from the reference population score for this variable are considered to be wasted which reflects recent or acute malnutrition. In addition, wasting represents receiving inadequate nutrition in the period immediately preceding the interview or survey. As such, it is possible that there are seasonal variations in wasting in under-five year old children. However, severe wasting, which is a Z-score of below -3 standard deviations from the reference, is closely linked to higher mortality risks in children.

The variable "Underweight" refers to a composite index for both of the previous indicators. This indicator is thus a representation of underweight children. This indicator is a general indicator of a population's nutritional health and is used to monitor nutrition over long periods of time.

Therefore the variable "Stunting" refers to the height-for-age scores and the category "not stunted" is comprised of all Z-scores that are the same as or higher than the standard deviation of the reference population. Thus the category "stunted" is comprised of all z-scores that are below the standard deviation of the reference population. Similarly the variable "Wasting" refers to the

weight-for-height score and the category "not wasted" consists of all Z-scores that are the same as or higher than the standard deviation of the reference population. The category "wasted" is comprised of all z-scores that are below the standard deviation of the reference population. Finally the variable "Underweight" refers to the weight-for-age category. The category "not underweight" consists of all Z-scores that are the same as or higher than the standard deviation of the reference population. The category "underweight" is comprised of all z-scores that are below the standard deviation of the reference population. In this part of the analysis, all observations that were flagged or reported as being out of plausible limits were excluded from the analysis so as to retain binary outcome variables.

The variable "Child Survival" refers to whether or not the child of the respondent was alive at the time of the interview. This variable is a simple binary outcome variable and is thus categorised as "alive" or "yes" for children who were alive at the time of the interview. In addition the category of "dead" or "no" is for children who were not alive at the time of the interview.

3.4 Hypotheses

The hypotheses to be tested in this study are:

Ho: There is a relationship between domestic violence and negative child health outcomes in Zimbabwe.

HA: There is no relationship between domestic violence and negative child health outcomes in Zimbabwe.

3.5 Ethical Considerations

This study is a secondary analysis of pre-existing data. No personal information or names of the respondents has been disclosed in the dataset, thus anonymity is guaranteed.

3.6 Data Management

The 2005 – 2006 ZDHS data was downloaded from the Demographic and Health Survey website. The data was presented in STATA format and STATA version 9 has been used for

analysis. From each of the three downloaded data sets, household, women's and child nutrition status, variables considered to be relevant to this study were identified, extracted and merged into one data set.

There were a total of 2,152 observations for respondents to the Domestic Violence module who have reported abuse from their partners. For some of the variables there were incomplete observations. This is due to the respondent's stating that they were unsure how to respond or they omitted the question completely. However, the majority of the questions, over 95%, were complete.

3.7 Data Analysis

The variables that will be used in this research will be analysed in three stages. The first stage is a univariate analysis of the variables. This is used to summarise the variables as it has been grouped together in the previous section. That is, the independent variables of socioeconomic, demographic and physical violence characteristics will be summarised in those groups. The same summaries for the dependent variables will be provided. This will be displayed as a series of frequency tables and discussion.

The second stage is bivariate analysis of the variables. This was done to examine the association between the independent socioeconomic, demographic, physical violence and the dependent variables of whether the child is not alive and the nutritional status of living children. In order to examine such an association, adjusted odds ratios were collected and displayed to explain the likelihood of negative child health outcomes occurring. Thus all poor outcome variables were coded as 1 and positive outcomes such as not stunted, not wasted, not underweight and child survival were coded as 0.

The final stage of the analysis is that of multivariate analysis. The logistic regression model is being used in this study because the outcome variables are dichotomous or binary. Furthermore the outcome variable for this stage of analysis is the negative or poor child health outcomes. Thus if the child is stunted, wasted, underweight and / or dead (mortality) they have been coded as 0 and the converse statuses were coded as 1. This ensures that only the negative values are used in the model. Logistic regression was used for each of the independent variables that are significant by each binary, dependent variable. Then a combined model of all the

independent variables by each dependent variable was used. The basic logistic regression equation is:

$L_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_k X_{ki}$

Where: L_i = dependent variables

α = constant

β_k = regression coefficients

X = independent variables

Chapter 4: Results.

4.1 Characteristics of the respondents:

Univariate analysis of the 2005- 2006 ZDHS data for female respondents who participated in the Domestic Violence module of the questionnaire was conducted for this section of the study. The analysis produced the following results with reference to their socioeconomic, demographic and physical violence characteristics.

Table 3.Characteristics of abused women in relationships who had given birth or are currently pregnant, ZDHS 2005 – 2006.

Characteristic	Frequency	Percentage
Socioeconomic:		
Age of the respondent at first birth		
< 19	1,248	61.72
>=19	774	38.28
Total	**2,022**	**100**
Mean = 19.07		
Highest educational level		
No education	86	4.25
Primary	822	40.65
Secondary +	1,114	55.09
Total	**2,022**	**100**
Employment Status *		
Not working	1,181	58.49
Working	838	41.51
Total	**2,019**	**100**
Type of residence		
Urban	619	28.76
Rural	1,533	71.24
Total	**2,152**	**100**
Demographic:		
Age of the respondent		
< 27	1,093	54.06
> =27	929	45.94
Total	**2,022**	**100**
Mean = 27.64		
Marital Status		
Married	2,112	98.14
Living together	40	1.86

Total	**2,152**	**100**
Number of household members*		
<5	1,591	78.68
>5	431	21.32
Total	**2,022**	**100**
Mean = 5.58		
Region*		
Manicaland	209	10.34
Mashonaland	640	31.65
Matebeleland	250	12.36
Midlands	311	15.38
Masvingo	234	11.57
Harare	242	11.97
Bulawayo	136	6.73
Total	**2,022**	**100**
Religion*		
Roman catholic	185	9.15
Other	1,837	90.85
Total	**2,022**	**100**
Physical Violence		
Domestic Violence		
No	1,372	63.75
Yes	780	36.25
Total	**2,152**	**100**
Hit during Pregnancy**		
No	599	76.8
Yes	181	23.2
Total	**780**	**100**
Physically forced sex*		
No	1,717	85.72
Yes	286	14.28
Total	**2,003**	**100**

*Some respondents did not provide answers.

** Frequencies and percentages based solely on the respondents who had experienced domestic violence.

In Table 3 it is seen that the mean age of the respondents in this study is 27.64 years old. More than half of the respondents (54.06%) are less than 27 years old but have at least one child. In addition, 45.94% of the respondents are older than 27 years old.

The demographic variables in the table also show that 98.14% of the respondents are married. The respondents were questioned regarding how many household members they have living with them. The highest percentage is shown for households with less than five members (78.68%).

This finding is consistent with the Zimbabwe Demographic and Health Survey (2007) report that found the average household size to be five members. In addition, Table 3 shows that few households report to have more than five members (21.32%).

It is evident that most of the respondents in this study reside in the Mashonaland region (31.65%) of Zimbabwe. This region is comprised of Mashonaland Central, Mashonaland East and Mashonaland West. The region with the lease number of respondents is that of Bulawayo (6.73%). However, these findings suggest that the respondents per region are almost evenly distributed considering the regions with more respondents are groups of provinces combined into one, such as Mashonaland and Matebeleland.

With regard to religious affiliations, 90.85% of the respondents are from other Christian faiths, traditional faiths, Muslims or other religions. Thus 9.15% of the respondents are Roman Catholics. Traditional faiths, Islam and all Christian denominations, including Catholicism, do not endorse the practice of cohabitation between men and women; therefore the higher marriage percentage that is demonstrated in this table becomes perfectly understandable.

It is evident from Table 3 that physical abuse by a spouse is occurring in Zimbabwe. The "domestic violence" variable in the table shows that women are experiencing physical abuse of various types by their husbands and partners. The table shows that 36.25% of the respondents had experienced physical violence in their relationships at the time of the interview. Of the women who had reported physical abuse, 23.2% of them reported having experienced being hit by their spouse during pregnancy.

The final physical violence characteristic shows that 14.28% of the women who had reported abuse had been physically forced to have sex by their spouse. This form of physical violence is related to unwanted and unplanned pregnancy that relates to care of the infant once it is born.

Table 4.Among the women, percentage who reported abuse by their partners, by type of abuse and child health outcomes

Type and Act of Abuse	No	Yes
Physical Violence		
Pushed	89.42	10.59
Slapped	76.14	23.86
Punched	89.1	10.9
Strangle or Burn	93.01	6.99
Attack with weapon	98.45	1.55
Sexual violence		
Physically forced sex	85.72	14.27
Child Health Outcomes		
Child Alive	6.03	93.97
Stunted	7.7	92.3
Wasted	53.37	46.63
Underweight	26.05	73.95

Table 4 shows that the commonest type of physical violence experienced by the respondents is being slapped (23.86%). The least frequent type of violence is being attacked with a gun, knife or any other weapon by their spouse (1.55%). The other types of physical abuse are experienced by approximately 10% or less of the respondents but are still occurring.

The table also shows that sexual abuse is occurring in Zimbabwe. The respondents were asked if they were physically forced to have sexual intercourse when they did not want to and 14.27% of them answered “yes”. This suggests that rape is taking place within marital and cohabiting relationships. In addition, sexual abuse is associated with unplanned and unwanted pregnancy.

With regard to child health outcomes, the issue of malnutrition is indicated by stunting, wasting and underweight measures. The table shows that the vast majority of the respondent’s children are stunted (92.3%), fewer than half are wasted (46.63%) and most are underweight (73.95%). These indicators are of importance to this study because it highlights poor care of under-five children in Zimbabwe that will most likely lead to mortality in the future.

With regard to under-five child mortality, 93.97% of the respondent’s children were alive at the time of the interview. Thus the overall under-five child mortality frequencies among physically abused women in Zimbabwe are low, despite malnutrition levels being so high.

4.2 Bivariate analysis

In order to investigate if the respondent's socioeconomic, demographic and physical violence characteristics are related to poor child health outcomes, bivariate analysis was carried out. Bivariate logistic regression was conducted to demonstrate the individual relationships of age at first birth, educational level, occupation, type of residence, age of the respondent, marital status, region, religion, domestic violence, hit during pregnancy and the experience of sexual violence. By using the unadjusted odds ratio statistic, the likelihood of an event, in this case, a negative child health outcome, occurring is assessed. The negative child health outcomes are stunting, wasting, underweight and child death.

Table 5 displays the odds ratios for each negative malnutrition indicator respectively with the selected characteristics of the respondents. To begin, the table shows that women who had experienced their first birth when they were older than 19 years are less likely to have stunted under-five children. With an unadjusted odds ratio of 0.88, women who had given birth for the first time after the age of 19 years are less likely to have wasted children. Similarly, the same women are less likely to have the underweight condition occur in their children, as the unadjusted odds ratio for this is 0.81.

The table shows that primary education is related with increased odds of stunting, wasting and underweight in under- five children of the respondents. In addition, secondary education and higher is associated with decreased odds of stunting, wasting and underweight conditions. This find is similar to that of the under-five child mortality finding that showed as educational level increases so too do the odds of child survival. In this case as a woman's educational level increases, the odds of her children being malnourished in any way decreases.

With regard to employment status, employed or "working" respondents are less likely to have stunted (0.83), wasted (0.92) and / or underweight (0.92) under- five children.

Rural residence does not increase the odds of stunting, wasting and underweight in under – five children. Table 5 shows that rural residence is associated with decreased odds of stunting occurring with an unadjusted odds ratio of 0.72. In addition, the unadjusted odds ratios for wasting and underweight, both being 0.98 shows that it is less likely to occur to children of the respondents.

Table 5.Bivariate Odds Ratios between child survival and selected characteristics of abused women

Characteristic	Stunting	Wasting	Underweight	Child Mortality
Socioeconomic:				
Age of the respondent at first birth				
< 19	R.C	R.C	R.C	R.C
>=19	0.87*	0.88*	0.81*	1.19*
Highest educational level				
No education	R.C	R.C	R.C	R.C
Primary	1.16*	1.06	0.67*	1.73
Secondary +	0.89	0.91*	0.60*	2.02
Employment Status				
Not working	R.C	R.C	R.C	R.C
Working	0.83*	0.92*	0.92*	0.99*
Type of residence				
Urban	R.C	R.C	R.C	R.C
Rural	0.72*	0.98*	0.98*	0.69
Demographic:				
Age of the respondent				
< 27	R.C	R.C	R.C	R.C
> =27	0.92*	1.00*	1.17	0.84*
Marital Status				
Married	R.C	R.C	R.C	R.C
Living together	0.93*	0.91*	0.8*	1.19*
Number of household members				
<5	R.C	R.C	R.C	R.C
>5	0.93	1.02	1.23	1.00**
Region				
Manicaland	R.C	R.C	R.C	R.C
Mashonaland	1.09	0.86*	1.08	1.34
Matebeleland	1.37	0.96*	1.18	1.21
Midlands	1.21	0.84*	1.13	1.53
Masvingo	1.03*	1.04	1.41	1.91
Harare	1.28	0.88*	1.08	2.44
Bulawayo	1.82	1.01	1.06	2.04
Religion				
Roman catholic	R.C	R.C	R.C	R.C
Other	1.02	0.82	0.83	0.59
Physical Violence:				
Domestic Violence				
No	R.C	R.C	R.C	R.C
Yes	0.97*	1.04	0.91*	1.05*
Hit during Pregnancy				
No	R.C	R.C	R.C	R.C
Yes	1.8*	1.04	1.51	1.09
Physically forced sex				
No	R.C	R.C	R.C	R.C
Yes	0.96	1.06*	1.69	0.89*

R.C = Reference Category,*p<0.05, **p<0.01,*variable dropped from the model.**

For the demographic characteristics, respondents who are older than 27 years, are less likely to have stunted young children (0.92), but are more likely to have underweight young children (1.17). With regard to wasting, respondents older than 27 years have even odds of having this form of malnutrition occur as the unadjusted odds ratio in this case in 1.00

Respondents who are in cohabiting or "living together" relationships are less likely to have malnourished children. For each malnutrition indicator, the odds ratios are less than the value of 1.00 which signifies reduced odds of stunting, wasting and underweight occurring.

The number of resident household members shows that more than five members are associated with reduced odds of stunting or chronic malnutrition (0.93). This finding suggests that more than five resident members decrease the chances of under – five children of the respondents being stunted. Conversely, more than five household members are associated with increased odds of wasting or acute malnutrition in under- five children (1.02) and the underweight condition of children (1.23). These findings suggest that more resident members leads to food and other nutritional resources being strained for a period of time resulting in acute malnutrition or temporary low weight of young children.

Region of residence shows that stunting is more likely to occur in all provinces of the country, without exception. This finding, similar to that of under-five child mortality, suggests that in terms of region there is no difference to the likelihood of stunting occurring. That is, since all provinces are related to higher odds of stunting occurring, there is no region or area where the odds are reduced. Table 5 shows that this is likewise true for the underweight condition in under-five children of the respondents since all of the unadjusted odds ratios values are larger than 1.00.

For wasting, however, the odds of wasting occurring in the under-five children of respondents is less likely in the provinces of Mashonaland, Matebeleland, Midlands and Harare, since all of these unadjusted odds ratios have values less than 1.00. The exceptions to this are the regions of Masvingo (1.04) and Bulawayo (1.01). In these two regions, it is likely that wasting will occur in the under- five children of the respondents.

With regard to religion, other religious faiths are associated with increased odds of stunting in under- five children (1.02). However, wasting and underweight are less likely to occur to

respondents of other religious affiliations with unadjusted odds ratios of 0.82 and 0.83 respectively.

With regard to physical violence characteristics, domestic violence has a reduced affect on the likelihood of stunting in under- five children (0.97) and underweight in under- five children (0.91). This means that with regard to domestic violence there are not increased odds under-five children being long – term or chronically deprived of nutritional supplements and other foods.

The physical violence characteristic of being hit during pregnancy by their spouse is associated with increased odds of stunting (1.02), wasting (1.04) and underweight (1.51). These findings suggest that malnutrition of all three types is more likely to be a result of the mother being hit during pregnancy. That is, since anthropometric indicators (height, weight and age) are only measured once there is a live birth; the findings of these measures are related to or as a result of violence occurring before delivery. In this way, the foetus and the mother are affected when a woman is hit whilst being pregnant. Possible explanations for stunting, wasting and underweight include pre-term delivery as a result of distress due to the violence and hence low birth-weight of the infant and / or other endogenous complications suffered to the foetus as a result of trauma to the abdominal area of the mother.

Table 5 finally shows that sexual violence reduces the odds of stunting in under-five children (0.96) yet increases the odds of the wasting (1.06) and underweight (1.69) conditions. These findings suggest that sexual violence toward the mother does not increase the likelihood of chronic or long- term malnutrition in under- five children, yet it does increase the odds of short term malnutrition.

The final outcome variable used in Table 5 is negative child survival. That is the table consists of the unadjusted odds ratios for under-five child mortality, the odds of children dying according to selected characteristics of the respondents. To begin, respondents who had given birth to their first child after the age of 19 years are more likely to experience under-five child mortality as the odds for this are 1.19.

Table 5 shows that respondents with primary education attainment (1.73) are more likely to experience under-five child mortality. Respondents with a secondary or higher educational attainment are less likely to experience under-five child mortality. Thus there appears to be a link

between child mortality and educational status. As educational level increases the likelihood of child mortality decreases.

The socioeconomic indicator of employment status shows that working respondents are less likely to experience under-five child mortality with an unadjusted odds ratio of 0.99. Urban residence is likewise associated with reduced odds, 0.69, of the respondent's children experiencing under-five mortality.

The demographic characteristics in the table show that respondents who are older than 27 years are less likely to experience under-five child mortality as the unadjusted odds ratio is 0.84. In addition, respondents who are living together increase the odds of under-five mortality occurring among the respondent's children. Related to this domestic situation is the number of residing household members. Table 5 shows that more than five members produces even odds (1.00) of under-five mortality occurring.

For region, all of the defined provinces of Zimbabwe are associated with increased odds of under-five child mortality. All of the unadjusted odds ratios for this characteristic are higher than the value of 1.00, thus proving that region of residence increases the likelihood of under-five mortality among the offspring of the respondents.

The characteristic that addresses religious affiliation shows that women of other religious practices, including traditional and other Christian faiths, are less likely to experience under-five child mortality with an unadjusted odds ratio of 0.59.

For physical violence characteristics, domestic violence increases the odds of under-five mortality (1.05). That is, women experiencing physical violence of any type by their spouses are more likely to have under-five child mortality occur to their children. Similarly women who are hit by their husbands during pregnancy are more likely to experiences under-five mortality (1.09), according to the findings. However, sexual violence, represented by "physically forced sex", shows the converse likelihood. That is, being physically forced to have sexual intercourse by a spouse reduces the odds of under-five child mortality occurring among the respondents.

Chapter 5: Multivariate Analysis of the Association between Domestic Violence and Child Health Outcomes

5.1 Introduction

This chapter will concentrate on the strength of associations between the respondent's background and domestic violence characteristics with child health outcomes. In doing so, a better understanding of which variables or characteristics are significantly associated within the logistic regression model is provided.

Initially, stepwise selection was used and variables that were not significant within the logistic regression model were eliminated. The predictor variables that do more to explain negative child health outcomes remain in the model. As such, the variable of "religion" has been removed from the model for all negative child health outcomes.

Logistic regression analysis has been carried out for all negative child health outcomes (stunting, wasting, underweight and under-five mortality) and all adjusted odds ratios (AOR) have been produced.

5.2 Multivariate analysis, displaying odds ratios of variable clusters by socioeconomic, demographic and physical violence characteristics respectively.

Table 6 shows the multivariate analysis of characteristics of the respondents. The characteristics were examined independently by cluster groupings of socioeconomic, demographic and physical violence variables for each negative child health outcome. All of the independent findings are presented all together in Table 6 but it is not a single model.

To begin, the table shows the odds ratios for negative child health outcomes by various socioeconomic characteristics of the respondents. The four socioeconomic characteristics that are used are that of age at first birth, highest educational level attainment, employment status and type of residence. Table 6 shows that respondents who were older than 19 years, when they gave birth to their first child, are less likely to experience stunting (0.89), wasting (0.87) and underweight (0.81) un their under-five children. This finding changes however with regard to child mortality, where the odds of under-five mortality occurring actually increases (1.21) in respondents who gave birth when they were older than 19 years.

It is evident from the table that primary education increases the odds of stunting and wasting in under- five children since both have odds ratios of 0.88. In addition, the odds of these health outcomes occurring to women with secondary or higher educational levels is less likely. The model shows that underweight is less likely to occur in under- five children of the respondents with both educational qualifications. Conversely, child mortality is more likely to occur to children of the respondents in instances of both educational attainment levels. That is, the educational level of the respondents, regardless of its level of attainment, is likely to be associated with increased child mortality, when assessed with other socioeconomic characteristics in the model.

Table 6. Among the women, odds ratios, from multivariate logistic regressions assessing the association between cluster variables, respectively and poor child health outcomes.

Characteristics:	Stunting	Wasting	Underweight	Child Mortality
Socioeconomic Variables cluster:				
Age of the respondent at first birth				
< 19	R.C	R.C	R.C	R.C
>=19	0.89*	0.87*	0.81*	1.21
Highest educational level				
No education	R.C	R.C	R.C	R.C
Primary	1.07*	1.06	0.66	1.71
Secondary +	0.88	0.88*	0.58	1.81
Employment Status				
Not working	R.C	R.C	R.C	R.C
Working	0.83*	0.92*	0.92*	0.98*
Type of residence				
Urban	R.C	R.C	R.C	R.C
Rural	0.77*	0.91*	0.93*	0.70*
Demographic variables cluster:				
Age of the respondent				
< 27	R.C	R.C	R.C	R.C
> =27	0.91*	1.00*	1.17	0.84*
Marital Status				
Married	R.C	R.C	R.C	R.C
Living together	0.82*	0.88*	0.81*	1.09*
Number of household members				
<5	R.C	R.C	R.C	R.C
>5	0.94*	1.01	1.23	1.07*
Region				
Manicaland	R.C	R.C	R.C	R.C
Mashonaland	1.08	0.86*	1.09	1.35*
Matebeleland	1.38	0.96*	1.17	1.21*
Midlands	1.2	0.84*	1.14	1.54*
Masvingo	1.02	1.04	1.42	1.92*
Harare	1.27	0.88*	1.11	2.46
Bulawayo	1.83	1.02	1.12	2.05
Physical Violence variables cluster:				
Domestic Violence				
No	R.C	R.C	R.C	R.C
Yes	1.00*	1.12	0.87*	1.77*
Hit during Pregnancy				
No	R.C	R.C	R.C	R.C
Yes	1.00**	1.04	1.70	1.12
Physically forced sex				
No	***	R.C	R.C	R.C
Yes		0.57*	1.11	2.43

R.C = Reference Category, *p<0.05, **p<0.01,*variable dropped from the model.**

With regard to employment status, as part of the model, working respondents are less likely to experience stunting (0.83), wasting (0.92), underweight (0.92) and child mortality (0.98) among their under – five children. These findings suggest that working mothers are not more susceptible to poor child health outcomes, when assessed with other socioeconomic characteristics in the model. Type of place of residence shows similarly that malnutrition of any kind and child mortality is less likely to occur to respondents who reside in the rural areas of Zimbabwe. This suggests that in terms of socioeconomic indicators, rural residence does not relate to an increased likelihood of poor health outcomes of under- five children of the respondents.

Table 6 then shows the odds ratios for negative child health outcomes by various demographic characteristics of the respondents. From this it is evident that respondents who are older than 27 years old are less likely to experience stunting (0.91) and child mortality (0.84) in their under-five children. Also respondents who are older than 27 years have even odds of wasting occurring in their under-five children, as the adjusted odds ratio for this is 1.00. The underweight condition (1.17), however, is more likely to occur in the children of the respondents if the respondents are older than 27 years old.

The marital status of "living together" is associated with reduced odds of malnutrition occurring in the under- five children of the respondents. That is, stunting (0.82), wasting (0.88) and underweight (0.81) is less likely to occur to the young children of respondents who are in cohabiting relationships when assessed with other demographic variables in the model. The likelihood of child mortality occurring, however, is increased for the women who are in cohabiting relationships. That is, child mortality is more likely to occur to the under- five children of respondents who are not married.

Stunting is less likely to occur to respondent's children if there are more than five resident household members as the adjusted odds ratio is 0.94 in this instance. However, more than five household members is likely to bring about the malnourished conditions of wasting (1.01) and underweight (1.23) in under – five children of the respondents. Child mortality is likewise more likely to occur in households with more than five members as seen in the adjusted odds ratio of 1.07.

The demographic variable of region of residence in Table 6 shows that all provinces of Zimbabwe are associated with increased odds of stunting and underweight in under- five children of the respondents. That is, this finding suggests that there is no province that is related to higher odds of these conditions occurring. Table 6 likewise shows that the regions of Masvingo (1.04) and Bulawayo (1.02) are the only two regions whereby wasting is more likely to occur to the under- five children of the respondents. The other regions used in this study are all associated with reduced or less likely odds of wasting occurring in under- five children.

In addition, all of the provinces or regions in Zimbabwe are associated with higher odds of under-five child mortality occurring to the children of the respondents. This finding, along with all the other demographic variables producing increased odds of child mortality, suggests that overall the demographic variables of abused respondents contributes to a higher likelihood of under-five child mortality occurring among their children.

Table 6 finally shows the odds ratios for negative child health outcomes by various physical violence characteristics of the respondents. According to the table, stunting is at even odds of occurring to children of the respondents if the mother experienced domestic violence of any type as the adjusted odds ratio for this is 1.00. The condition of being underweight is less likely to occur to the respondent's children if the mother has experienced domestic violence of any type with an odds ratio of 0.87. However, Table 6 shows that wasting (1.12) is more likely to occur to young children if their mother experienced any form of physical domestic violence. This suggests that due to the trauma, stress or injury immediately following the violence, mothers may be temporarily unable or unfit to provide nutritional care for their under- five children. Similarly the odds of child mortality occurring is increased by domestic violence experienced by the mother of the child as the unadjusted odds ratio for this is 1.77. This finding suggests that women who are physically harmed by their spouses are unable, for any period of time, to ensure the survival of their young children.

In addition, Table 6 shows that being hit by a spouse during pregnancy increases the odds of all malnutrition conditions as well as under-five child mortality in the children of the women experiencing the abuse. These findings suggest that being hit during pregnancy is increasingly dangerous for all child health outcomes as it increases the chances of each of the outcomes occurring to under- five children. This form of physical violence is thus of significant importance

to this study as it highlights a single form of violence that is capable of producing all of the poor child health outcomes studied.

Wasting does not become more likely when a child's mother is physically forced to have sexual intercourse by her spouse as the adjusted odds ratio for this is 0.57. This suggests that sexual violence does not have any temporary or limited time effects on increasing the likelihood of wasting in under- five children. However, Table 6 shows that physically forced sexual intercourse increases the odds of both underweight in under-five children (1.11) and child mortality (2.43).

5.3 Multivariate analysis of combined variables of socioeconomic, demographic and physical violence characteristics.

Table 7 is a combined model of all selected socioeconomic, demographic and physical violence characteristics of the respondents and negative child health outcomes. For this section, each child health outcome will be discussed with regard to its relationship to each of the characteristics. Thus the table presents all of the findings together and in this case it does signify a combined model.

To begin, the model shows that stunting (0.57) is less likely to occur to respondents who had given birth to their first child when older than 19 years. In addition, stunting is more likely to occur in the under-five children if the mother or respondent has only a primary education (1.09), but less likely to occur if she has a secondary or higher educational attainment level (0.89). Working respondents and rural residing respondents are less likely to have stunted children as the adjusted odds ratios for these characteristics are both less than 1.00 respectively.

With regard to the demographic variables, respondents who are older than 27 years are less likely to experience stunting (0.80) in their under- five children. Respondents who are living together (0.43) and respondents who have more than five resident household members (0.95) are both less likely to have stunting occur in their under- five children. In terms of place of residence, or region, respondents residing in the Mashonaland regions have even odds of stunting occurring in their young children, yet respondents in the Matabeleland, Midlands, Harare and Bulawayo regions are more likely to have stunted young children. The only region in Zimbabwe that appears to be associated with reduced odds of stunting is that of the respondents residing in the Masvingo province with an adjusted odds ratio of 0.59 in this area.

The physical violence characteristics of this model prove that domestic violence experienced by the respondent increases the odds of stunting in their under-five children as the adjusted odds ratio for this is 1.15. Similarly, a respondent being hit during pregnancy by her spouse increases the likelihood of stunting occurring in their young children.

Table 7. Among the women, odds ratios, from multivariate logistic regressions assessing the association between socioeconomic, demographic and physical violence characteristics and child health outcomes.

Characteristic	Stunting	Wasting	Underweight	Child Mortality
Socioeconomic:				
Age of the respondent at first birth				
< 19	R.C	R.C	R.C	R.C
>=19	0.57*	1.01	0.72*	1.36
Highest educational level				
No education	R.C	R.C	R.C	R.C
Primary	1.09	1.13	1.03	0.82*
Secondary +	0.89*	0.93*	0.94*	0.75*
Employment Status				
Not working	R.C	R.C	R.C	R.C
Working	0.46*	1.02	1.13	0.87
Type of residence				
Urban	R.C	R.C	R.C	R.C
Rural	0.19*	0.64*	0.62*	2.29
Demographic:				
Age of the respondent				
< 27	R.C	R.C	R.C	R.C
> =27	0.80*	1.14	1.34	0.66*
Marital Status				
Married	R.C	R.C	R.C	R.C
Living together	0.43*	0.77*	0.95*	1
Number of household members				
<5	R.C	R.C	R.C	R.C
>5	0.95*	1.26	1.43	0.77*
Region				
Manicaland	R.C	R.C	R.C	R.C
Mashonaland	1.00*	1.02	1.4	0.58*
Matebeleland	1.86	1.02	1.63	0.49*
Midlands	1.55	0.72*	1.19	2.95
Masvingo	0.59*	1.39	1.78	1.21
Harare	1.33	0.87*	1.2	4.09
Bulawayo	1.42	0.76*	1.04	1.49
Physical Violence:				
Domestic Violence				
No	R.C	R.C	R.C	R.C
Yes	1.15	1.18	0.90*	0.68*
Hit during Pregnancy				
No	R.C	R.C	R.C	R.C
Yes	1.24	1.00*	1.66	1.26
Physically forced sex				
No	R.C	R.C	R.C	R.C
Yes	***	0.50*	0.98*	3.41

R.C = Reference Category,*p<0.05, **p<0.01,*variable dropped from the model.**

Secondly, with regard to wasting, respondents who had given birth to their first child when they were younger than 19, are more likely to have wasted young children (1.01). Respondents who have a primary education (1.13) and respondents who are working (1.02) are more likely to have wasting occur in their under – five children. Conversely, respondents with a secondary education or higher (0.93) and those residing in rural areas (0.64) are less likely to have wasting occur in their children.

In terms of demographic characteristics, women who are older than 27 years are more likely to have wasted (1.14) under-five children. Respondents, who are living together or cohabiting, are less likely to have wasted under-five children as the adjusted odds ratio for this is 0.77. However, more than five resident household members (1.26) are associated with increasing the odds of wasting in under-five children.

With regard to region, Midlands (0.72), Harare (0.87) and Bulawayo (0.76) are associated with reduced odds of wasting occurring in the young children of the respondents. Conversely, the Mashonaland (1.02), Matabeleland (1.02) and Masvingo (1.39) are all associated with increased odds of wasting in under- five children.

The physical violence characteristics in the model shows that domestic violence experienced by respondents increases the odds of wasting with an adjusted odds ratio of 1.18. Table 7 also shows that being hit during pregnancy (1.00) produces even odds of wasting occurring in the under-five children of the respondents. Finally being physically forced to have sexual intercourse reduces the likelihood of wasting occurring among young children.

For the poor health outcome of being underweight, respondents who had given birth to their first child when older than 19 years are less likely to have this malnourished condition occur in their children as the adjusted odds ratio is 0.72. Respondents with primary education alone (1.03) and respondents who are employed (1.13) are more likely to have the underweight condition appear in their under-five children. Respondents with secondary or higher education (0.94) and respondents who reside in rural areas (0.62) are less likely to have underweight children.

The demographic characteristics in the table prove that the underweight (1.34) condition is more likely to occur to women who are older than 27 years old. In addition, the status of living together or cohabitation reduces the odds of the underweight condition occurring with an

adjusted odds ratio of 0.95. The other demographic characteristics, that of more than five household members and the various provinces of Zimbabwe all increase the odds of the underweight condition occurring in the under- five children of the respondents, as seen by the respective adjusted odds ratios that are all above the value of 1.00.

With regard to the physical violence characteristics, respondents experiencing any form of physical domestic violence (0.90), as well as those respondents who have been sexually abused by their partners (0.98) are less likely to have the underweight condition occur in their children. However, being hit during pregnancy increases the odds of the underweight condition occurring in the young children of the respondents.

Finally, respondents who had given birth to their first child when older than 19 years are more likely to experience under-five child mortality (1.36). Following this, primary, secondary and higher educational attainment levels of the respondents all reduce the odds of under-five child mortality occurring to their children. Rural residence, however, increases the odds of child mortality occurring to the under-five children of the respondents, as the adjusted odds ratio for this is 2.29.

With regard to demographic variables, under-five child mortality (0.66) is less likely to occur to women who are older than 27 years. The marital status of living together produces even odds of under-five child mortality occurring to the offspring of the respondents. The demographic characteristic of household size shows that more than five residents reduce the odds of under-five child mortality occurring with an adjusted odds ratio of 0.77. For province of residence, two of the seven provinces reduce the likelihood of under-five mortality occurring, namely Mashonaland (0.58) and Matabeleland (0.49). The remaining regions in the model show increased odds of child mortality occurring to the children of the respondents.

For physical violence characteristics, respondents who experience domestic violence of any kind have equal chances of having child mortality among their young children relative to others. However, respondents who are hit during their pregnancy (1.26) and respondents who have been physically forced to have sexual intercourse by their spouse (3.41) are more likely to experience under-five child mortality.

In terms of findings, the cluster analysis (table 6) shows findings that are diverse depending on which variable is in question. That is, for example, the socioeconomic cluster alone shows increased odds of child mortality per educational level attainment. In table 7, the combined model, the odds are based on all variables and not just the socioeconomic variables. Hence the findings here incorporate all the characteristics of the abused women and it is seen that, for example, educational level decreases the odds of child mortality in under- five children. The inverse of this can also be seen between the two models. For example, in Table 6, it is seen that the odds of wasting in under-five children, to respondents who are aged 19 years and older is lower, however, in the Table 7, the odds are higher.

Table 8. Among the women, odds ratios, from multivariate logistic regressions and bivariate logistic regressions, in associating differentials between physical violence characteristics and child health outcomes.

Characteristic	Stunting		Wasting		Underweight		Child mortality	
Physical Violence:	**Biv OR**	**Multi AOR**	**Biv OR**	**Multi AOR**	**Biv OR**	**Multi AOR**	**Biv OR**	**Multi AOR**
Domestic Violence	0.97	1.00*	1.04*	1.12	0.91	0.87*	1.05	1.77*
Hit during Pregnancy	1.8	1.00**	1.04*	1.04*	1.51*	1.70*	1.09	1.12*
Physically forced sex	0.96*	***	1.06	0.57*	1.69*	1.11	0.89	2.43*

***p<0.05, **p<0.01, ***variable dropped from the model.**

Table 8 is a comparison table highlighting the bivariate adjusted odds ratios and multivariate unadjusted odds ratios for negative child health outcomes by physical violence variables. The multivariate values displayed in this table are that of the independent analysis as seen in Table 6.

The table shows a difference between the bivariate odds ratio and multivariate odds ratio for stunting in under-five children if their mother had experienced domestic violence. According to the bivariate finding, respondents are less likely to have stunting occur to their children (0.97), but the multivariate finding shows that these children have even odd of being stunted (1.00) if their mothers experience domestic violence. In addition, if their mothers are hit during pregnancy, the bivariate odds ratio shows that their children are more likely to be stunted (1.8) whereas the multivariate odds ratio shows that they have even odds of stunting occurring. Finally

the variable of a respondent being physically forced to have sexual intercourse by her husband was dropped from the multivariate model but the bivariate model shows that under-five children of these respondents are less likely to become stunted (0.96).

With regard to wasting, both the bivariate and multivariate models show that domestic violence increases the likelihood of this condition occurring in young children, as both findings are greater than the value of 1.00. In addition, the odds of wasting occurring in the young children of respondents who are hit during pregnancy is more and the odds ratio for both the bivariate and multivariate models are an identical 1.04. For the experience of sexual abuse, the bivariate finding shows that wasting is more likely to occur (1.06), whereas the multivariate finding shows that it is less likely (0.57) to occur to these respondents.

For the malnutrition condition of underweight, there are fewer differences in the two models. To begin, if the mother of the child experienced domestic violence the bivariate and multivariate findings are that the underweight condition is less likely to occur, with odds ratios of 0.91 and 0.87 respectively. Also both models show that women who are hit during their pregnancy are more likely to have underweight under-five children. Similarly both the bivariate (1.69) and multivariate (1.11) findings show that sexual abuse increases the odds of underweight appearing.

Finally for child mortality, both models show that the odds of child mortality occurring increases if the child's mother had experienced domestic violence, as the odds ratios are 1.05 and 1.77 respectively. Similarly if the respondent was hit during pregnancy by her spouse, the odds of child mortality occurring are higher in both the bivariate finding (1.09) and the multivariate finding (1.12). However, if the respondent is forced to have sexual intercourse with her spouse, the bivariate finding indicates that the odds of child mortality occurring is less (0.89) but the multivariate finding indicates that the odds of under-five child mortality is higher (2.43).

Chapter 6: Discussion.

The main objective of this study is to examine the relationship between domestic violence and negative child health outcomes. This study has shown that 36.25% of the Zimbabwean women who participated in the Domestic Violence module experienced physical violence from their spouse. This finding is similar to studies elsewhere in Sub-Saharan Africa that found high prevalence of domestic violence (Institut Nationale de Sante Publique, 2005: 50). The fact that any type or form of physical violence is occurring signifies a problem in Zimbabwe and thus requires attention.

All of the women used in this study have or had children. The ZDHS report shows that women with children experience more physical violence than women without children (Zimbabwe Demographic and Health Survey, 2007: 261). This study also found that 92.3% of the under-five children are stunted, 46.63% are wasted, and 73.95% are underweight. These indicators of malnutrition are aligned with other findings of child nutrition in Africa. In a study of six Sub-Saharan African countries, it was found that a quarter of all children aged 1-35 months in Malawi in 1992, Zambia in 1992, Ghana in 1993, Nigeria in 1990 and Tanzania in 1991/2 were stunted (Madise, et.al, 1999: 335). The same study found that the weight –for- age scores, which indicates wasting, deteriorated for children after their birth and until their 2nd birthday, thereafter it stabilized (Madise, et.al, 1999: 335). This was found to be true of height- for- age scores as well as weight-for-height scores (Madise, et.al, 1999: 335). In Zimbabwe, the Demographic and Health Survey in 2005/6 found that 29% of all the under-five children measured were stunted, 17% were underweight and 6% were wasted (Zimbabwe Demographic and Health Survey, 2007: 167). It was likewise found that malnutrition as indicated by these scores, increases until the children's 2nd birthday and decreases from there until their 5th birthday (Zimbabwe Demographic and Health Survey, 2007: 167). In addition, male children are somewhat more likely to be malnourished than female children (Zimbabwe Demographic and Health Survey, 2007: 167).

The significant findings with regard to this relationship will here be discussed. The significance of odds ratios is important as it implies that the findings are true, reliable and the likelihood that the difference found between groups or variables is by chance alone.

For wasting, it was found that domestic violence does increase the odds of acute malnutrition occurring in the children of the respondents. That is, the significant odds ratio of 1.04 for wasting in this category implies that physical violence of the mother increases the odds of the children being malnourished for a temporary or short-term basis. This finding can be correlated to a study that found that stress due to violence has an effect on child survival (Asling – Monemi, et.al, 1999: 14). Domestic violence affects women's ability to obtain adequate nutrition, rest and medical care (Asling – Monemi, et.al, 1999: 14). In addition, domestic violence limits women's ability to access resources needed for the healthcare of children (Asling – Monemi, et.al, 1999: 14). These resources may be inaccessible because women are economically dependent on their husbands and/ or socially isolated from their families and communities.

In addition, this study has found that more than 5 household members are related to increased odds of wasting in young children. This finding suggests that more resident members lead to increased odds of acute malnourishment in children. This could be due to some or all household members being temporarily unable or out of work and hence resources within the home being strained and stretched. It could similarly be due to the neglect and / or mistreatment of under – five children in the home because there are many other household members, perhaps elderly constituents that receive more care and attention.

This is related to an abused woman's ability to feed and provide care for her children. With regard to being able to access appropriate nutritional care for under-five year old children, two studies in India found a strong association between the abuse of mothers and their inability to adequately feed their children. The first study, in Karnataka, India found that children of women who were physically abused received less food than other children, suggesting that these women could not negotiate on behalf of their children with their husbands (Ganatra, et.al, 1998: 597). The second study found that overall the children of physically abused women was more malnourished than children of non-abused women (Rao and Bloch, et.al, 1993). The experience of malnutrition in Zimbabwe can thus be paralleled to that of India and broadly speaking it can be argued that abused Zimbabwean women are unable to negotiate food and care on behalf of their children.

It is found to be true that respondents who had experienced domestic violence are less likely to have underweight young children, as indicated by the multivariate finding in the model. This

implies that domestic violence is not associated with an increase in the likelihood of this form of malnutrition occurring. That is, in conjunction with various other characteristics, domestic violence does not lead to the long-term ability of women to provide nutritional care for their children. In addition to this, it was found, in this study that women who are employed are less likely to have underweight children. This finding suggests that financially independent women are better able to provide food of nutritious quality to their young children, which is why there are reduced odds of long-term malnutrition.

This study found true that domestic violence and being hit during pregnancy produces even odds of stunting occurring in under-five children, according to the logistic regression model fitted for this variable.

Following, the significant odds ratio of 1.04 for wasting occurring if the respondent had been hit during pregnancy implies that there are consequences for the children if the mother had been physically hit prior to giving birth. This finding proved to be true in both the bivariate and multivariate models fitted for the analysis. For the condition of underweight, the bivariate odds ratio shows a significant value of 1.51 for the children of respondents who had been hit during pregnancy. This implies that mothers who experience this form of physical abuse are more likely to have underweight under-five children. This further implies that there is an association between being hit during pregnancy and the long- term malnutrition of children. Furthermore the underweight index in the multivariate model, comprised as a composite index of stunting and wasting, thus proving that being hit during pregnancy is more likely to produce this form of composite malnutrition. Being hit during pregnancy and the likelihood of the underweight condition occurring, shows a significant odds ratio of 1.70, according to the logistic regression findings. Thus the occurrence of being hit during pregnancy has long-term implications for the respondent's ability to provide nutritional care for her young offspring.

A univariate finding of this study is that 23.2% of Zimbabwean women experienced being hit during pregnancy by their spouse. This occurrence is of particular importance in research. A study in Uttar Pradesh, India found that 34% of abused women displayed at least one symptom of gynaecologic morbidity (Stephenson, et.al, 2006: 201). This is a reproductive health issue as it relates to the transmission of sexually transmitted infections and women's abilities to regulate their own fertility safely and in a healthy way.

Experiencing violence while being pregnant has implication for whether or not the pregnancy will result in a live birth or not (Zimbabwe Demographic and Health Survey, 2007: 267). A study conducted on 500 Pakistani women at tertiary care hospitals in the Karachi province found that 44% had experienced abuse during their pregnancy (Farid, et.al, 2007: 143).

A study in Haiti showed that over four times more women die during pregnancy and childbirth in this region than in Latin America and the Caribbean as a whole (WHO, 2007). In addition, the neonatal mortality rate in Haiti in 2006 was 34 deaths per 1,000 live births (WHO, 2006). This prompted a study by Small and others (2008) to investigate if domestic violence is a possible contributor to these statistics (Small, et.al, 2008). The study found that among 200 pregnant women, 44% reported experiencing violence in the six months preceding the study (Small, et.al, 2008: 229). Of these women 77.8% reported that violence came from their intimate partners (Small, et.al, 2008: 229). The study also found a significant relationship between recent experiences of violence and increased occurrences of "pregnancy symptom distress" (Small, et.al, 2008: 230), which is said to include vaginal bleeding, fatigue and heart burn (Small, et.al, 2008: 227).

Ceccuti and Stewart (1993) found that the most common region struck during pregnancy is the abdomen with 63.9% of abused pregnant women being hit in this area. Thus this study's finding is consistent with a study by Peterson and others (1997) that found that the severe blunt trauma to the abdominal region of pregnant women leads to various pregnancy outcomes. These include spontaneous abortion, fetal death, placental abruption and fetal injuries. In addition, it has been suggested that trauma to the abdomen during pregnancy leads to preterm labour which is related to low birth weight and has malnutrition consequences for young children (Newberger, et al., 1992). Literature also contends that abuse during pregnancy is related to inadequate child care (Dietz, et al, 1997). Possible explanations for stunting, wasting and underweight include pre-term delivery as a result of distress due to the violence and hence low birth-weight of the infant and / or other endogenous complications suffered to the foetus as a result of trauma to the abdominal area of the mother.

It is seen that sexual abuse is associated with reduced odds of wasting in under-five children of the respondents. This suggests that rape of the mother does not have temporary or short-term malnutrition consequences for their young children. Possible reasons for this could be that due to

the severity and frequency of the rape, the mother may be temporarily incapable of providing for her young children.

In addition, the bivariate analysis showed that sexual abuse decreases the odds of stunting occurring to under-five children of the respondents. This means that sexual violence or rape does not increase the odds of long-term or chronic malnutrition in under-five children. There exists very little literature concerning the effects of sexual abuse of the mother on their children's nutritional health outcomes. Reproductive health studies, however, shows that sexual abuse is associated with gynaecological problems and adverse pregnancy outcomes including miscarriage, fetal death and low birth weight (WHO, 2008). This later finding is concurrent with the bivariate odds ratio finding in this study that shows a significant value of 1.69 for the underweight children of respondents who had experienced sexual violence. This implies that there is an association between rape and the respondent's ability to provide long-term nutritional care for their offspring. That is, sexual violence does in fact increase the odds of the underweight condition in under-five children.

Stephenson, et.al (2006) found that domestic violence, including sexual violence by a spouse, may influence gynaecologic morbidity which includes physical trauma (Stephenson, et.al, 2006). Physical trauma to the mother impacts on her ability to regulate her reproductive system. Physical trauma depending on the severity incapacitates women for varying lengths of time. This means she is unable to care for herself and her children for that time. In addition, the intention of child conception and hence birth has consequences for how that child will be cared for. If the mother did not want to fall pregnant and have a child, she would most likely care for the child less than if the pregnancy was intended.

Any experience of domestic violence, being hit during pregnancy and sexual abuse by a spouse also increases the odds of under-five child mortality. All of the findings in the multivariate model are significant of this and all are above the value of 1.00. This finding is in accordance with the Asling- Monemi and others (1999) that found that lifetime experiences of any kind of violence toward the mother is significantly associated with child mortality. Consistent with studies conducted elsewhere in Africa, it was found that the rural areas of Zimbabwe experienced higher under-five mortality rates than urban areas (Zimbabwe Demographic and Health Survey, 2007: 113). The rural areas endure 72 deaths per 1,000 live births compared to the urban areas that

experience 64 deaths per 1,000 live births (Zimbabwe Demographic and Health Survey, 2007: 113). The majority of women (71.24%) reside in rural areas. Economic disparity and civil unrest on Zimbabwe has left most people living in impoverished rural areas.

In addition, mother's education presents a discrepancy in child survival rates with secondary education translating into lower mortality rates than children whose mothers have less education than that (Zimbabwe Demographic and Health Survey, 2007: 113). More than half of the Zimbabwean women in this study were unemployed (58.49%) at the time of the 2005- 2006 ZDHS. In South Africa it was found that the most significant structural constraint women face is that of economic dependence on their husbands and partners (Vogelman and Eagle, 1991: 216). A result of this dependence is that men have developed a perception of ownership over their wives and objectified them into property (Vogelman and Eagle, 1991: 216). Thus one of the reasons that abused women remain in these relationships is because of or related to their financial dependence on their partners. In addition, financial dependence entails relying on male partners to give their wives and partners money and in some cases, permission to obtain food and healthcare for themselves and their children (Asling – Monemi, 1999: 14). In this way economic dependence is of paramount importance to the survival of the women and children in these relationships and is thus important to this study. Related to marital status, this study has found that child mortality is more likely to occur to the under-five children of unmarried or cohabiting women. This suggests that the stability of the mother's relationship influences the survival of her young children.

With regard to demographic characteristics, male children have higher mortality than female children from the neonatal period and including the under-five age category (Zimbabwe Demographic and Health Survey, 2007: 113). Birth intervals are likewise significant with children born less than two years after a previous birth being more than twice as likely to die during infancy as those born more than two years after a previous birth (Zimbabwe Demographic and Health Survey, 2007: 114).

Chapter 7: Conclusions and Recommendations.

7.1 Conclusions

This study has shown that domestic violence is occurring in Zimbabwe. The extent of the problem is limited to respondent's participation, but it cannot be ignored even though many abused women do not acknowledge their abuse nor discuss it in the open. Therefore this snapshot of abuse does not incorporate all abused women but it does represent them.

This study addresses the core child health issues in Africa, malnutrition and mortality. Health issues on the continent are pertinent to development and the achievement of the Millennium Development Goals (MDG's). Similarly, issues concerning the health and development of children are of the utmost importance in all developing nations. This study has attempted to merge health issues with that of young children, thus contributing to a body of research that is lacking in Africa.

This study has shown, that in various settings, domestic violence is in fact a contributor to poor child health outcomes in Zimbabwe. Of particular importance is the finding that physical violence, being hit during pregnancy and sexual violence increases the odds of child mortality in under-five children. this is evident by the multivariate model findings seen in Tables 6 and 8. In this way, it is here suggested that physical violence incapacitates women to the extent that they are unable to sufficiently care for their children. This finding has been explored in conjunction with socioeconomic and demographic characteristics of the respondents. In addition, temporary or short – term malnutrition, wasting, in under-five children is more likely to occur if mothers experience physical abuse.

With regard to this study's initial research question, is there an association between domestic violence and negative child health outcomes in Zimbabwe; the finding is that there is. The health of young children cannot be segregated from the experiences of their mothers, who remain their primary caregivers. In such, traumatic experiences of the mother contribute negatively to the health of young children. Physically abused women are in fact less able to provide nutritional care, for varying lengths of time, for their offspring. In terms of the most adverse child health outcome, child mortality, the odds of this occurrence is exacerbated by experiences of domestic

violence. With regard to the relationship between domestic violence and child health outcomes, this study has shown that the likelihoods of various negative child health outcomes vary according to type of violence, experiences of abuse during pregnancy and sexual abuse. As discussed, in some cases the likelihood of malnutrition and mortality are increased by these happenings and in some cases it is evenly likely or less likely to occur.

This study proved the significance of using Zimbabwe as the region of study in that, Zimbabwe, is a highly popularised state in terms of politics and economics but not in terms of social experiences. This study offers an examination of Zimbabwe in the context of its social experiences that are not isolated from its economic and political issues. That is, the economic crisis in Zimbabwe is inextricably linked to the ability of women to access resources to care for their children. Economic and political hardships are also related to the aggression and aggravation of men toward their wives. It is important that these issues are not isolated from domestic violence but are kept in mind when discussing abuse. Thus, in this broader context the significance of studying Zimbabwe comes to light.

Finally this study proves that existing frameworks should encompass domestic violence as a maternal factor that is related to negative child health outcomes. That is, in the case of the Mosley and Chen (1984) framework, domestic violence should be included as a significant maternal factor, along with mother's age, parity and birth intervals in explaining morbidity and mortality in under-five children. According to Mosley and Chen (1984), mortality and morbidity are influenced and operate through proximate determinants, such as various maternal factors. This study shows that there is need to expand on the existing maternal factors to include domestic violence. That is, there is need to have domestic violence represent an occurrence that, in conjunction as well as on its own, is an explanatory variable of poor child health outcomes. Given the findings of this study, there is a substantiated need for this inclusion to be made.

In terms of policy and legislation, this study substantiates the need for awareness of these possible consequences. That is, this study has brought to the fore, the consequences of domestic violence that are not only applicable to the women who are experiencing abuse. Thus, policy that addresses domestic violence needs to reference these consequences in substantiating the extent of the problem. In addition, legislation that addresses domestic violence needs to address and determine the implications for the children of abused women.

7.2 Recommendations

With regard to areas of further study, there are a number of issues that could aid further studies of this nature. To begin, this study did not address child abuse. That is, physical and sexual abuse of under-five children is undeniably linked to child health outcomes and arguably more evident in households where the mother is also abused. This area of study would contextualise negative child health outcomes with relation to overall or general abuse levels and patterns in Zimbabwe. That is, if child abuse is occurring in households where mothers are also being abused, the scope and extent of mortality and morbidity among children would change and possibly be more severe.

Secondly, studies of this genre would benefit greatly from a more detailed examination of the societal and ethnic norms that contribute to domestic violence. That is, in the context of Zimbabwe, detailed studies that explain the practices embedded in society that exacerbate domestic violence and poor child health would create a study of the determinants of domestic violence that contribute to poor child health in Zimbabwe. The determinants of violence were not the focus of this research, as this study's focus was the association between domestic violence on mortality and morbidity. However, in order to develop a body of research that is all encompassing and well – studied, a secondary focus such as this would be useful.

Thirdly, a study that differentiates and compares the child health outcomes of the children of women who are abused with those of women who have not been abused would be of considerable importance to this growing accumulation of research. That is, a study that compares the survival chances of children of women who are abused and those who are not would produce evidence of a casual relationship between domestic violence and child health. A causal relationship is important as it determines the extent of the consequences of physical violence in the household.

Finally, a study that addresses the frequency of abuse more specifically is needed in this regard. That is, a study that elaborates on times a week or month that domestic violence takes place is beneficial to child health outcomes in that this information would enable research to elaborate if the extent of child health is related to frequency of abuse. In this way, an examination of whether or not child health deteriorates more with increased frequencies of abuse is possible. Such research is important as it forms the next stage of this research. That is, now that a contributory

relationship has been established here, the next logical step in research is to evaluate if the incidence of abuse is contributory to negative child health.

7.3 Limitations of the study

7.3.1 Underreporting:

In general, underreporting on domestic violence is more common than women over - reporting their abuse (Asling – Monemi, et. al, 1999: 13). For this reason, women who do not report their abuse could be a possible limitation to this and any other study regarding this type of violence. Women may not report their abuses for a number of reasons. One possibility is that they fear their partners would find out and retaliate by physically, emotionally or verbally assaulting them. Another possible reason for the underreporting is for the stigma attached to abuse. That is, women may feel embarrassed to admit to anyone including strangers that they have been abused.

7.3.2 Usefulness of other data:

This data excludes information on child abuse and planned or intended pregnancy. Data of this nature would broaden the scope of the study, but too much so for the purposes of this research. Child abuse information would contribute more to the link between violent relationships and subsequent child death. Information on the intention of the pregnancy would have given a better insight into the psychological and emotional state of the mother. This is important as it is argued that the emotional condition of the mother is linked to the birth outcome and the survival of the child (Butchart and Villaveces, 2003: 17). In this way, this would offer a link between infant and child mortality and maternal health or wellbeing. However, this link would offer a psychological explanation for the relationship and this research does not aim to evaluate the relationship on this level. Overall however, adding these two types of data would aid in intervention planning as it would clearly establish links that highlight groups of people who are at risk of death.

7.3.3 Temporal sequence:

Since this study is cross- sectional it is very difficult to establish the temporal sequence of the predictor and outcome variables.

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Appendix:

ANNEXURE A: Bivariate table of *domestic violence* by *stunting*

stunting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	0.9651066	0.1772237	-0.19	0.047	0.0333923	1.083192

ANNEXURE B: Bivariate table of *hit during pregnancy* by *stunting*

stunting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ipreg_hit_1	1.8129496	0.3429894	-0.11	0.016	0.0090902	1.035485

ANNEXURE C: Bivariate table of *sexual violence* by *stunting*

stunting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ivsex_2	0.96195	0.3553762	0.93	0.352	0.7535391	2.215059

ANNEXURE D: Bivariate table of *domestic violence* by *wasting*

wasting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	1.043594	0.1027698	0.43	0.665	0.8604153	1.265772

ANNEXURE E: Bivariate table of *hit during pregnancy* by *wasting*

wasting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ipreg_hit_1	1.040241	0.1938221	0.32	0.749	0.7409636	1.517093

ANNEXURE F: Bivariate table of *sexual violence* by *wasting*

wasting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ivsex_2	1.064705	0.1286636	-0.4	0.046	0.0256598	1.235993

ANNEXURE G: Bivariate table of *domestic violence* by *underweight*

underweight2	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	0.9055425	0.1007865	-0.89	0.033	0.0172806	1.026282

ANNEXURE H: Bivariate table of *hit during pregnancy* by *underweight*

underweight2	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ipreg_hit_1	1.51142	0.3945193	2.25	0.054	0.070806	2.671727

ANNEXURE I: Bivariate table of *sexual violence* by *underweight*

underweight2	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ivsex_2	1.685435	0.1964291	1.27	0.205	0.8950517	1.677769

ANNEXURE J: Bivariate table of *domestic violence* by *child mortality*

mortality	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	1.0514434	0.1629862	-0.84	0.04	0.0258508	1.23907

ANNEXURE K: Bivariate table of *hit during pregnancy* by *child mortality*

mortality	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ipreg_hit_1	1.093428	0.4023485	0.24	0.808	0.5315863	2.249089

ANNEXURE L: Bivariate table of *sexual violence* by *child mortality*

mortality	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Ivsex_2	0.8875346	0.2293887	-0.46	0.044	0.0153479	1.472935

ANNEXURE M: Multivariate table of *physical violence* by *stunting*

stunting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	1.004896	0.3194862	0.02	0.038	0.0238888	1.873887
_Ipreg_hit_1	1.004808	0.3582914	0.01	0.009	0.0049953	2.021166

ANNEXURE N: Multivariate table of *physical violence* by *wasting*

wasting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	1.124188	0.1821678	0.72	0.47	0.8182896	1.54444
_Ipreg_hit_1	1.039118	0.1906924	0.21	0.834	0.7251997	1.488922
_Ivsex_2	0.5691413	0.213977	-1.5	0.034	0.0272394	1.189164

ANNEXURE O: Multivariate table of *physical violence* by *underweight*

underweight2	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	0.8686005	0.1621024	-0.75	0.04	0.025106	1.252205
_Ipreg_hit_1	1.698203	0.3971139	2.26	0.024	1.073844	2.685577
_Ivsex_2	1.110315	0.4622798	0.25	0.802	0.4909628	2.510985

ANNEXURE P: Multivariate table of *physical violence* by *child mortality*

alive	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Idv2_2	1.7662059	0.2394586	-0.85	0.034	0.0152634	1.413733
_Ipreg_hit_1	1.124086	0.4145962	0.32	0.751	0.5455712	2.31605
_Ivsex_2	2.432717	2.498647	0.87	0.387	0.3249538	18.21217

ANNEXURE Q: Multivariate table of *socioeconomic, demographic and physical violence characteristics* by *stunting*

stunting	**Odds Ratio**	**Std. Err.**	**z**	**P>z**	**[95% Conf.**	**Interval]**
_Iagebirth_2	0.5729119	0.1823376	-1.75	0.04	0.0370298	1.069043
_Iedu_1	1.093469	0.6305568	-0.1	0.92	0.2491392	3.506715
_Iedu_2	0.088198	0.7736472	0.16	0.027	0.0288136	4.339495
_Ioccupati~2	0.4583552	0.1388928	-2.6	0.043	0.0223557	0.815698
_Ires_1	0.1906967	0.2114724	-1.52	0.026	0.025447	1.582866
_Iage_2	0.8045388	0.2525812	-0.69	0.048	0.0448267	1.488599
_Ims_1	0.4348319	0.5186633	-0.69	0.037	0.0352601	2.371964
_Ihousehol~2	0.9562531	0.3373573	-0.24	0.031	0.0247306	1.885118
_Iregion2_2	1.000131	0.6611973	0.14	0.047	0.0320466	3.57897
_Iregion2_3	1.861605	1.358505	0.9	0.368	0.4688377	7.712906
_Iregion2_4	1.554547	1.119283	0.7	0.481	0.4209883	6.268943
_Iregion2_5	0.5865419	0.380867	-0.78	0.044	0.0137111	2.06914
_Iregion2_6	1.332629	2.218083	0.26	0.797	0.0769145	28.19542
_Iregion2_7	1.421997	2.270535	0.27	0.788	0.0776116	29.06774
_Idv2_2	1.152034	0.3732068	0.32	0.752	0.5760347	2.14678
_Ipreg_hit_1	1.235813	0.4847852	0.67	0.505	0.6141193	2.692174

ANNEXURE R: Multivariate table of *socioeconomic, demographic and physical violence characteristics* by *wasting*

wasting	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Iagebirth_2	1.014722	0.1620576	0.09	0.927	0.7420016	1.38768
_Iedu_1	1.135634	0.4142678	0.35	0.727	0.5555573	2.32139
_Iedu_2	0.9355652	0.3436108	-0.19	0.042	0.0417837	1.920615
_Ioccupati~2	1.023241	0.1610535	0.14	0.889	0.7506667	1.392066
_Ires_1	0.6352062	0.1793779	-1.61	0.018	0.0052089	1.104812
_Iage_2	1.141558	0.179091	0.84	0.399	0.8393806	1.552519
_Ims_1	0.7782396	0.4702984	-0.41	0.048	0.0280802	2.543919
_Ihousehol~2	1.262626	0.2429099	1.21	0.225	0.8659977	1.840912
_Iregion2_2	1.015699	0.3202702	0.05	0.961	0.5474745	1.884368
_Iregion2_3	1.022271	0.3564241	0.06	0.95	0.5161631	2.024628
_Iregion2_4	0.7247932	0.2418678	-0.96	0.033	0.0268452	1.394008
_Iregion2_5	1.392028	0.4854737	0.98	0.329	0.7112383	2.763747
_Iregion2_6	0.8653576	0.3682914	-0.34	0.031	0.0314837	1.992033
_Iregion2_7	0.7523804	0.3182792	-0.67	0.041	0.0323629	1.723935
_Idv2_2	1.186902	0.1981652	1.03	0.305	0.8556542	1.646386
_Ipreg_hit_1	1.001502	0.1890739	0.01	0.044	0.0317563	1.449941
_Ivsex_2	0.501036	0.1980879	-1.75	0.03	0.0358558	1.087419

ANNEXURE S: Multivariate table of *socioeconomic, demographic and physical violence characteristics* by *underweight*

underweight2	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Iagebirth_2	0.7201447	0.1327328	-1.78	0.035	0.0018009	1.033494
_Iedu_1	1.0314227	0.415498	-0.11	0.909	0.4042438	2.239256
_Iedu_2	0.940222	0.4570343	0.09	0.028	0.0296836	2.461001
_Ioccupati~2	1.128985	0.2047121	0.56	0.945	0.0223224	1.592401
_Ires_1	0.6278116	0.2145381	-1.36	0.013	0.0113317	1.226606
_Iage_2	1.34201	0.2465805	1.6	0.109	0.936173	1.923779
_Ims_1	0.9519579	0.6640916	-0.06	0.041	0.028614	3.722087
_Ihousehol~2	1.432788	0.337959	1.52	0.127	0.9024118	2.274884
_Iregion2_2	1.453873	0.5126045	1.06	0.289	0.7284691	2.90163
_Iregion2_3	1.675165	0.6697838	1.29	0.197	0.765104	3.667708
_Iregion2_4	1.242135	0.4602559	0.59	0.558	0.6008521	2.56785
_Iregion2_5	1.88664	0.7532955	1.59	0.112	0.8626251	4.126253
_Iregion2_6	1.244727	0.6368987	0.43	0.669	0.4565974	3.393241
_Iregion2_7	1.045637	0.5196517	0.09	0.928	0.3947828	2.769515
_Idv2_2	0.893375	0.1722076	-0.58	0.039	0.0122878	1.303503
_Ipreg_hit_1	1.661183	0.4008569	2.14	0.132	1.044363	2.674218
_Ivsex_2	0.977928	0.4577862	0.11	0.015	0.015128	1.46705

ANNEXURE T: Multivariate table of *socioeconomic, demographic and physical violence characteristics* by *child mortality*

mortality	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
_Iagebirth_2	1.357806	0.4496082	0.92	0.356	0.7095465	2.598333
_Iedu_1	0.8234259	0.6412496	-0.25	0.043	0.0178955	2.788825
_Iedu_2	0.7458883	0.5794289	-0.38	0.027	0.0160521	2.428807
_Ioccupati~2	0.8722279	0.2794887	-0.36	0.716	0.4828792	1.648592
_Ires_1	2.29218	1.135577	1.66	0.097	0.8606085	6.051936
_Iage_2	0.6626386	0.2097311	-1.3	0.014	0.0135633	1.232224
_Ims_1	1.002301	0.5196517	-0.59	0.12	0.8626251	4.126253
_Ihousehol~2	0.7669556	0.2801345	-0.73	0.046	0.0374855	1.569192
_Iregion2_2	0.5785929	0.3367998	-0.95	0.034	0.0178074	1.815522
_Iregion2_3	0.4910549	0.3197731	-1.08	0.027	0.0143432	1.750338
_Iregion2_4	2.953777	2.268294	1.34	0.181	0.6117769	13.49935
_Iregion2_5	1.256662	0.8762647	0.21	0.837	0.2676816	5.084773
_Iregion2_6	4.091708	3.791851	1.5	0.135	0.6471854	25.36575
_Iregion2_7	1.488979	1.174687	0.56	0.572	0.3447618	6.86983
_Idv2_2	0.6870158	0.2219716	-1.16	0.024	0.013647	1.294154
_Ipreg_hit_1	1.25919	0.4850184	0.6	0.55	0.5918659	2.678919
_Ivsex_2	3.49612	3.455759	1.14	0.255	0.4222559	25.72944