A quantitative analysis of socioeconomic position and the occurrence of violence in South Africa

by

Katherine Doolan

A mini-dissertation submitted in partial fulfilment of the requirements for the master's degree in public health

University of Cape Town
December 2005

DECLARATION

I, ***Katherine Doolan***, hereby declare that the work on which this dissertation is based is original (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being or is to be submitted for any other degree in this or any other University.

I hereby grant permission to the University of Cape Town to reproduce for the purpose of research either the whole or any portion of the contents of this dissertation in any matter whatsoever.

Signed by candidate

January 7, 2006
Date

EXECUTIVE SUMMARY

Violence is the second leading cause of premature death and one of the leading causes of morbidity in South Africa (Bradshaw et al., 2003). Unlike many public health problems, the causes of violence are predominantly socioeconomic (rather than biological) in nature. The intersection between violence and varying measures of socioeconomic position is one that deserves specific attention in South Africa due to high levels of violence in the country, the social nature of violence, and the high degree of socioeconomic inequities existing in the country.

The aim of this dissertation is to identify risk factors for violence and the degree to which socioeconomic position (operationalised as employment, education and household wealth) plays a role in determining rates of violence within South Africa. Specific objectives of the research are:

1) To determine the rate and descriptive characteristics of violence in South Africa;

2) To identify individual and household level risk factors associated with the experience of violent injury among South Africans; and,

3) To compare the degree to which different components of socioeconomic position affect the experience of violent injury among South Africans and the likelihood of a violent death occurring in the household.

Data for this research came from the 1998 South African Demographic and Health Survey. The outcome of interest was interpersonal physical violence, defined as an intentional act of physical force committed against another person which results in injury or death. Logistic regression analysis for survey data was conducted at the individual and household levels using Stata Version 8.0 (College Station, Texas, USA). Controlled model building procedures were utilised in multivariate analyses.

This research found that the overall monthly violent injury rate in South Africa averaged 158/100,000 people (95% CI: 123/100,000, 203/100,000). An individual's experience of

violence was significantly correlated with being male, increasing age, increasing education, alcohol use, living in an informal settlement, and being employed. No association was found between the experience of violence and race of the individual, sex of the head of household or household wealth at this level. In the multivariate analysis, the effect of employment on violence diminished when other measures of socioeconomic position were controlled for, yet the protective effect of living in the wealthiest quintile remained.

Of households sampled in the SADHS, 0.89% (95% CI: 0.71%, 1.11%; N= 103) had experienced one or more deaths due to violence in the past year. Households that were most likely to experience a death due to violence were those in informal urban areas, in the 4th quintile of the asset index (the second wealthiest group), had eight or more family members, were headed by a female or were Black/African. While the crude effect of employment of the household head was protective against the experience of a violent death at the bivariate level, this effect was diminished once demographic characteristics of the head of household and other measures of socioeconomic position were controlled for. Similarly, the effects of the asset index or head of household demographics on violent death were no longer significant in the multivariate analysis.

Based on the bivariate analysis, there was evidence that household deaths due to violence have greater negative correlation with increasing socioeconomic position than violent injuries at the individual level. These individual level findings are not consistent with research conducted in more developed countries (where employment and education are commonly protective against violence), therefore they require further investigation to draw out the pathways between employment and education and the individual experience of violence. Possible reasons for the inconsistency could be the influence of heavy alcohol use in the sample population which confounded the association between employment and violence at the individual level or the close relationship between race and socioeconomic position in South Africa. Although temporality is notoriously difficult to establish in cross-sectional studies such as this, the results have pertinent implications in terms of monitoring changes in violence over time and identifying areas for future research.

This research provided an overview of the epidemiology of violence in South Africa that enables researchers working on small-area studies or studies that address particular types of violence (for example, youth violence or violence against women) to compare results to those at the national level or an earlier time period. Currently in South Africa, the response to violence is heavily weighted on the reactive side rather than the preventive one, as response is strongest in the fields of law enforcement and criminal justice. It is clear from this research that the issues surrounding violence expand far beyond those that can be addressed through the criminal justice system alone. Violence has an immense impact on the health of an individual and the community at large. In order for an effective preventive response to the astounding rates of violence in South Africa to take place, the Departments of Health and Social Welfare must take active steps to make coordinated and committed efforts to ensure that violence is monitored closely through surveillance, violence reduction targets are set and intervention and prevention programmes are developed to meet those targets. Evaluation of these initiatives through surveillance mechanisms and further epidemiological research will in turn lead to the adjustment and improvement of violence prevention programmes and policies.

ACKNOWLEDGEMENTS

I would like to thank the Medical Research Council in Cape Town and in particular Dr. Debbie Bradshaw, Rosana Norman and Ria Laubscher for providing the dataset for this research, as well as for their invaluable guidance and assistance with analysis and the many inquiries along the way. I would also like to thank Richard Matzopolous and Samed Bulbulia from the Crime, Violence, and Injury Prevention Unit for their comments and feedback during the beginning stages of this research.

Much appreciation goes to my advisors Professor Rodney Ehrlich and Dr. Landon Myer for their continual guidance, encouragement and time. I would like to especially thank Landon for his never-ending advice and encouragement throughout the MPH programme.

I would also like to express my gratitude to Lillian Artz and Dee Smythe at the Gender, Health and Justice Research Unit for giving me the opportunity to gain field experience in South Africa, providing me with a space to work and feedback on my research, and particularly for all of the advice and friendship. My time spent in South Africa wouldn't have been the same without them.

Finally, thank-you to my family and friends for making the past two years in Cape Town possible, and to Guy Harling for assistance in analysis planning and with the final submission of the paper.

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

1.1 Violence as a public health concern

Internationally and within South Africa there is a growing recognition of violence as a major public health concern. Violence affects the health of the community through myriad pathways that are both biomedical and sociological in nature. The complexity of the relationship between violence and health and the importance of the surrounding social context requires that violence research extends beyond the fields of criminology and law (the traditional academic centres of violence research in South Africa). Specifically, it is important to turn to the field of public health and research the epidemiology of violence in order to identify the root causes of violence and find ways to measure and critically assess the social and economic environment in which violence in South Africa is taking place (Butchart and Brown, 1991). By understanding the epidemiology of violence within South Africa, public health initiatives and social policies can utilise primary prevention methods to curb the high rates of violence in the country. Primary prevention is at the centre of public health efforts. With respect to violence prevention, this approach addresses the upstream (or root) causes of violence at both individual and societal levels to reduce or eliminate the catalysts for violence. The effect of public health initiatives is widespread rather than individualised, meaning whole communities or target populations benefit from the effort.

Kawachi and colleagues have suggested that the social conditions that are prevalent in areas experiencing high crime rates are also relevant in explaining geographic differences in other health outcomes (Kawachi et al., 1999). When the pathways leading to violence (such as unemployment or poverty) and pathways linking violence with other health problems (such as

increased rates of HIV transmission) are better understood, public health initiatives can address these interactions. By utilising more holistic and comprehensive methods that consider the complexity of causes and results of violence rather than focus on the motivation of an individual offender, programmes developed with the goal of violence prevention may also be effective in addressing other health and social problems.

1.2 Definitions and types of violence

Violence can take the form of physical, sexual, psychological, verbal, or economic abuse. Violence can be interpersonal, self-inflicted or political (which is also referred to in the literature as collective violence since a person or group of people is generally attacked for their association with a particular group). The term 'interpersonal violence' encompasses several sub-topics such as child abuse, intimate partner violence, sexual violence, elder abuse, violence in the workplace, youth violence and other violent crime.

This research will focus on interpersonal physical violence; an intentional act of physical force committed against another person which results in injury or death. The data used in this dissertation is victim-based, hence analysis will identify risk factors for and the distributions of violent victimisation in South Africa rather than that of perpetrating violence. Given the difficulties in accessing a large sample of the perpetrator population that is required for national epidemiologic research, this method is common in studies of violence. Thomson (2004) has shown that in South Africa victims and perpetrators of violence often share similar characteristics in terms or sex, age and race, suggesting that demographic differences between victims and perpetrators may not be very significant. As this research is addressing the

problem of violence from a public health perspective, it is particularly important to look at the phenomenon in light of who is being victimised, rather than who is perpetrating violence.

1.3 Socioeconomic position in the South African context

Unlike many public health problems, there are few instances when the causes of violence can be attributed primarily to biological phenomena; rather, causes are predominantly socioeconomic in nature. Socioeconomic position has long been tied to poor health outcomes and increasingly it has been researched with respect to violence. Proxies for socioeconomic position (namely employment, education and household wealth) are the primary risk factors of interest in this study.

In South Africa, socioeconomic position and race are closely intertwined (Parry et al., 2005). Historical policies in South Africa ensured that socioeconomic position was determined by an individual's race (or 'population group' as set out by the Population Registration Act of 1950). This Act created four population groups in which each person was assigned a racial classification at birth. The four groups were African (alternatively Black), Coloured, Asian (or Indian), and White. Membership to a population group dictated an individual's residential location, standard of education they received, jobs that were available, facilities they could use, and many other day-to-day activities that determined both quality of life and social status within the community (Gilbert, 1996). Although the population group classification system was repealed in 1991, the health and social inequities that were created from this system remain today. For the remainder of the dissertation 'race' is used in reference to this population group classification. Most socioeconomic and health data in South Africa have

been collected and reported under this classification scheme and as a result, it is common for health and social research in South Africa to continue using this classification to monitor the improvements in socioeconomic disparities in health over time (Parry et al., 2005).

1.4 Social Epidemiology

Social epidemiology is a discipline in public health that specifically seeks to identify the social determinants of health and illness within a population. While sociologists study how social structures and levels of stratification within a society are defined and redefined, social epidemiologists study the effect that these structural positions have on the health of the population (Lynch and Kaplan, 2000). What sets social epidemiology apart from other types of epidemiology (chronic or infectious disease epidemiology for example) is the explicit focus on societal determinants of health. Emphasis is placed on drawing out the pathways and mechanisms that mediate or modify the relationship between broad social and economic factors (such as income, education, and employment) and disease or injury. Social epidemiology is increasingly being used to test theories around the risk factors associated with violence in particular contexts. Identifying the root causes of violence within a specific country will enable professionals in the fields of medicine, law enforcement, criminal justice, education, social work, and policy-makers to engage in appropriate primary prevention efforts to reduce the appalling burden of violence in South Africa.

Statistical methods used in social epidemiology are continuing to develop. One such methodology that is increasingly used to better understand the particular pathways between socioeconomic factors and health outcomes is multilevel research. The complexity of the

interactions between social and economic determinants of health requires that exposures are explored from several different directions, as well as throughout an individual's lifecourse (Lynch and Kaplan, 2000). This is why statistical analysis on multiple levels (such as the examination of exposures and pathways that are biological as well as psychological or social in nature or exposures that come from the individual, family, organizational, or societal levels) are often utilised in the field.

1.5 The need to understand the role of socioeconomic position in determining rates of violence in South Africa

Internationally, epidemiological research conducted in developing countries has been referred to as 'exotic'; despite the fact that a majority of the world's population resides in these areas (Pearce, 2004). Particularly with respect to violence it could be argued that developing countries are not so much 'exotic', but rather they provide a 'mainstream' environment for conducting this research, as worldwide, violence disproportionately affects low- and middle-income countries. In fact, it has been estimated that 90% of all violence-related deaths occur in these countries (Krug et al., 2002). Pearce (2004) notes that it is important to avoid applying research methodologies and assumptions that are utilised in developed countries to developing countries without first taking into consideration the local customs, beliefs, economic divisions and social practices that are intrinsically different from area to area. For example, while income is a common proxy for socioeconomic position in developed countries it is not an adequate measure of such in South Africa (or many developing countries), as sharing amongst neighbours and family members is common (thereby increasing wealth and available resources without monetary income) and a large percentage of the population is

unemployed in the formal sector and without any income at all. This point is reiterated by Lynch and Kaplan (2000) as they point out the importance of understanding the conceptual theories (or pathways) that link socioeconomic position to health outcomes in a particular context before identifying what measures of socioeconomic position are most suitable for the research.

As violence has been identified as a serious public health threat within South Africa, it is imperative to examine the risk factors for violence that are specific to the South African context. Since nationally representative epidemiological studies addressing interpersonal violence have yet to be conducted in South Africa, the relationship between socioeconomic position and violence has not been established in this setting. Furthermore, it has yet to be determined which measure of socioeconomic position is the most applicable with respect to violence and also the strength of the relationship between violent injury versus violent death and socioeconomic position. Associations between socioeconomic position and self-reported health or overall mortality have been found in the United States (Backlund et al., 1996), Canada (Veenstra, 2000), the United Kingdom (Ecob and Davey Smith, 1999) and other developed countries. Relationships between socioeconomic position and violence (Sampson et al., 1997, Blau and Blau, 1986; Krahn et al., 1986) have also been found in industrialised countries. However, it cannot be assumed that these relationships are consistent in developing countries, particularly when the same operational measure of socioeconomic position is used.

South Africa has a political, historical, cultural, and social backdrop that could make the association between socioeconomic position and violence different than that found in other

countries. For example, the effects of socioeconomic position in South Africa may be more clouded by race or residential location (such as living in a township or informal settlement) than for other countries due to apartheid policies that ensured that position was determined by skin colour. Owing to limitations in available data this research will not explore these issues in great detail, but it will be able to shed light on the risk factors for violence occurring at the household and individual levels, determine which socioeconomic factors are risk factors for this critical health problem, and draw out the relationship that these risk factors have with respect to race particularly. With these results, researchers can proceed to identify potential mediating factors that are present in the observed relationship between socioeconomic position and violence through further primary data collection and analysis.

High rates of violent crime in South Africa foster an urgent need for understanding the risk factors associated with violence in this setting. A study of the social conditions that are prolific in violent areas is particularly important in South Africa where discriminatory and inequitable policies during the apartheid regime defined a repressive social hierarchy and current policies (such as land redistribution and economic empowerment for example) are working to redefine this structure.

1.6 Aim and objectives

It is the aim of this dissertation to analyse the prevalence of violence from a public health perspective by identifying risk factors for violence and the degree to which socioeconomic position plays a role in determining rates of violence within South Africa.

Specific objectives of the research are:

1) To determine the rate and descriptive characteristics of violence in South Africa;
2) To identify individual and household level risk factors associated with the experience of violent injury among South Africans; and,
3) To compare the degree to which different components of socioeconomic position affect the experience of violent injury among South Africans and the likelihood of a violent death occurring in the household.

2.0 LITERATURE REVIEW

2.1 The relationship between violence and public health

Violence is the second leading cause of premature death and one of the leading causes of morbidity in South Africa (Bradshaw et al., 2003). While the direct health effects of violence are obvious, the presence of violence in a community can indirectly affect the health and well-being of individuals regardless of whether direct victimisation occurs. Both direct and indirect outcomes of violence are discussed at length below.

2.1.1 Violence and physical health

The most obvious health consequence of violence is physical trauma. In 1990, trauma and violence were the second leading cause of years of life lost (YLL) due to death before the age of 65 years in South Africa, accounting for 11% of total YLL (Gilbert, 1996). A decade later, this trend persists with homicide and violence as the second leading cause of YLL, accounting for 7.5% of the total YLL for all people. This rate is 11.6% of the total YLL for males (almost

twice the total YLL that is due to tuberculosis for males) and 2.7% for females (Bradshaw et al., 2003). It is interesting to note that homicide and violence are the third leading cause of death for all people (HIV/AIDS and ischemic heart disease being numbers one and two) but the second leading cause of years of life lost. This indicates the young age at which the population is affected by violence in this country (Bradshaw et al., 2003).

Aside from its direct health outcomes, violence affects the physical health of individuals indirectly through the creation of an unsafe environment. Opportunities for physical activity within the community are greatly reduced when people feel threatened or unsafe going outdoors in the evening or sending children out to play unattended. For instance, the National Victims of Crime Survey conducted in South Africa in 2003 found that nearly a third of respondents would not allow their children to play outside where they lived; nearly a third were prevented from walking, playing, or resting in open spaces; and a fifth would not walk to work or town, all for fear of violence and crime (Burton et al., 2004).

2.1.2 Violence and mental health

Victims of violence may also experience emotional trauma. Victims may experience emotional disturbances such as post traumatic stress disorder (PTSD) that is frequently associated with flashbacks, nightmares, anxieties, phobias, and withdrawal from society.

A study conducted in the former townships outside of Cape Town reported that 97% of children surveyed had heard gunshots near their home, nearly half had seen the dead body of a stranger, and nearly a third had seen someone shot or stabbed in their own home (Standing,

2003). While these children were not the direct recipients of violence, their experiences with violence have the potential to induce significant emotional trauma. Frequent witnessing of violence may perpetuate the cycle of violence as it has been linked to mental health conditions such as depression and low self-esteem (Seedat et al., 2004), both of which could lead to other risky health behaviours such as alcohol and drug abuse, self-destructive behaviour or lack of control and submissiveness in sexual relationships.

2.1.3 Economic effects of interpersonal violence on the health care system

Throughout the world it has been demonstrated that violence is a financial and administrative burden on both the health care system and the national economy (Waters et al., 2004). The health care system is not only burdened by the increase in trauma patients due to violence, but economically through costs associated with hospital and physician care, emergency medical transport, medical equipment, mental health counselling, rehabilitation, prescriptions, coroner's costs, funeral expenses and related insurance costs (Gabor et al., 1996). Direct medical costs per gunshot victim at the Groote Schuur Hospital in Cape Town averaged US$10,308 in 1998 (Peden and Van der Spuy, 1998). Violence against health workers and it's presence in the workplace is also a cause of decreased staff morale, which further exacerbates the health care system through higher staff turn-over and increased absenteeism (Marais et al., 2002).

2.1.4 Social effects of violence

South Africa has been described as having a 'culture of violence' in which violence becomes an acceptable method for solving disputes, gaining social acceptance and acquiring goods

(Vogelman and Simpson, 1991; Thomson, 2004; Schonteich and Louw, 2001). Arguably, the normative and legitimised use of violence embedded in this environment may have emerged in part from the historical use of violence to attain political goals (Hamber and Lewis, 1997). It has been noted that South Africa's history of political violence has resulted in decreased levels of cohesion and trust amongst neighbours, both within and between population groups (Hamber, 1999). These decreased levels of cohesion and trust may perpetuate the continuation of violence in communities as they have been identified as risk factors for violence in other settings (Sampson et al., 1997; Kennedy et al., 1998).

Violence is a complex, social phenomenon that both feeds off of social conditions and perpetuates the very social conditions that are risk factors, creating a cycle that is difficult to break. For example, high rates of violence within a community may result in a lack of investment in the area, leading to poor street lighting, a lack of recreational spaces for youth, and/or an exodus of business. These factors in turn exacerbate rates of violence due to unsafe and dark streets that provide an opportunity to commit crimes, a lack of engaging and stimulating positive activities for youth, and an increase in unemployment which then could create frustration and stress within families and the community.

2.2 Epidemiology of violence in South Africa

2.2.1 Violent crime and homicide

In 2000, the World Health Organization estimated that the global death rate due to violence was 28 per 100,000 people (Prinsloo, 2004). For comparison, the homicide and interpersonal violence age-adjusted rate for South Africa during this year was 72.5/100,000 people, and

60.4/100,000 for the World Health Organization's African region (Matzopoulos et al., 2004). In the city of Cape Town homicide was identified as the primary cause of premature death in 10 of the 11 sub-districts in 2001 (Groenewald et al., 2003). The National Injury Mortality Surveillance System reported in 2002 that homicide was the leading cause of non-natural death in South Africa, accounting for 45% of all fatal injuries within all age groups, and reaching 56% of fatal injuries in both the 15-24 and 25-34 year age groups (Matzopoulos et al., 2003).

While South Africa was plagued with political violence during the Apartheid-era (reaching rates of 250 lives lost per month in the early 1990s), political violence has since declined and is now over-shadowed by crime-related violence (Hamber, 1999). In 1999, one third of all reported crimes were violent in nature, substantially more than the 15% in the United States and the 6% of all crimes recorded in the United Kingdom (Schonteich and Louw, 2001). In the former township areas around Cape Town, organised crime is a substantial part of the local economy and involves thousands of people, creating a community structure that is built around and dominated by gangs and criminal elite (Standing, 2003).

2.2.2 Violence against women

South Africa is said to have the highest rates of violence against women of any country in the world not at war (Wood and Jewkes, 1997). Violence against women includes crimes and abuse such as rape, intimate partner violence, rape homicide, violence against prostitutes, other forms of sexual abuse, and female genital mutilation. Interviews conducted with women attending antenatal clinics in Soweto, found over 55% of women to be victims of

physical/sexual violence in 2002 (Dunkle et al., 2004). In 1999, women were killed by an intimate partner at a rate of 8.8 per 100,000 women aged 14 years and older; the highest reported female homicide rates of anywhere in the world (Mathews et al., 2004). While statistics on rape are notoriously difficult to collect in any country due to lack of reporting, it is clear that rape is a particular problem in South Africa. In 1995, South Africa was referred to as the 'rape capital of the world' by the Human Rights Watch report on domestic violence and rape (Jewkes and Abrahams, 2002:1231). In 1996, there were 210 reported cases per 100,000 women in South Africa, compared to 80/100,000 in the United States in 1990 and 132/100,000 in Botswana in 1993 (Jewkes and Abrahams, 2002).

In addition to the physical and mental health outcomes associated with living with violence and abuse, violence against women has serious implications for other public health concerns. The high incidence of rape in South Africa directly results in increased HIV infection rates as well as that of other sexually transmitted diseases. Intimate partner violence (or domestic violence) affects transmission rates indirectly through the creation and perpetuation of gender inequality that greatly reduces the ability of women to successfully negotiate safe sex practices or have a voice in the relationship regarding family planning.

2.2.3 Youth violence

Following overall patterns of violence in South Africa, youth involvement in violence shifted from political violence in the 1980s to the involvement in violent crime in the late 1990s. A qualitative study conducted by the Centre for the Study of Violence and Reconciliation (CSVR) in 1998 found that the primary motives for youth involvement in violent crime

included economic gain, the attainment of material possessions, and to prove manhood and independence through a gang structure. Violence was said to have taken place due to drugs, robberies, punishment within the gang for not fulfilling duties, to protect turf and honour, and to achieve respect (CSVR, 1998).

Owing to the HIV epidemic, there have been increasing numbers of children left without parents (Monasch and Boerma, 2004). While the relationship between orphanhood and crime and violence has yet to be fully explored (Bray, 2003), it has been hypothesised that violence within a community may increase as the number of adult role models within the community decreases and the number of impoverished and independent children increases due to HIV/AIDS (Bradshaw et al., 2002).

2.2.4 Occupational violence

Although less researched, it is known that violence within the workplace occurs globally. Aside from occupations that are associated with violence such as the military, police and security services, violence is found embedded in the informal sector in South Africa (a major source of employment for many women in the South African population) (Pick et al., 2002), and within the taxi cab ranks (Gilbert, 1996). A study conducted in Cape Town hospitals found that nearly half of nurses felt unsafe or very unsafe at work due to crime and violence (Marais et al., 2002). High rates of violence have also been documented in the agriculture sector, specifically sugarcane farming in KwaZulu-Natal (Robins et al., 1998).

2.3 Socioeconomic position and health

The term 'socioeconomic position' is often used to describe the social and economic stratification within a society. Other similar terms used in the literature include social class, social stratification, social status, social inequality and socioeconomic status (Krieger et al., 1997). The term 'socioeconomic position' refers to the status of an individual that is based on available resources as well as prestige, and generally both child-based and adult-based measures are used. This term is used more frequently than socioeconomic status, as the latter prioritises prestige over material resources as the key determinant of one's position in society (Krieger, 2001).

One of the central principles in sociology is that stratification within a society (be it through income or prestige based measures) leads to the differential distribution of resources within a society (Williams, 1990). This inequitable distribution of resources clearly has direct health implications and as expected, the association between socioeconomic position and health has been recognised and documented for centuries (Lynch and Kaplan, 2000). Recently, a variety of pathways and mechanisms connecting socioeconomic position and health have been proposed (for examples see Wilkinson, 1997; Kennedy et al., 1996). In general, those with higher levels of social position have better health due to an overall greater level of knowledge, skills, and resources that provide them with jobs, higher incomes and greater access to health services, healthier foods, and residential neighbourhoods that are safer and less polluted.

There are many ways in which to measure socioeconomic position (Lynch and Kaplan, 2000); however, the traditional components of socioeconomic position are income, education, and

occupation (Mayer and Jencks, 1989). In settings such as South Africa these measures become complex and inadequate as employment rates, formal educational attainment and incomes are low or nonexistent, thus traditional components of socioeconomic position are not applicable (Myer et al., 2004).

2.4 Socioeconomic position and violence

Many theories about income and violence stem from the work of Friedrich Engels in 1844 and Robert Merton in 1938. Engels' book, *Conditions of the Working Class in England* (1968, reissued), proposes that poverty dehumanises individuals, enabling them to commit acts freely while Merton's (1968, reissued) essay "Social Structure and Anomie" suggests that the displacement associated with being unable to attain goals through conventional methods creates a sense of anomie that leads to the use of alternative methods (such as crime and violence) to attain the goals. Others hypothesise that violence is catalysed by frustration that is created by the deprivation of resources (Hsieh and Pugh, 1993) or the subculture of violence that is created in urban poor communities that value fatalism and the excitement associated with delinquency and violence (Blau and Blau, 1982).

International and South African research on the epidemiology of violence and the effect of socioeconomic position as a determinant of violence demonstrates that there are a multitude of ways in which to conceptualise both violence (such as homicide, different types of violent crime, or by using either mortality or morbidity measures) and socioeconomic position (such as education, employment, income, or asset ownership). In a meta-analysis of 34 international aggregate data studies Hsieh and Pugh (1993) found that of the 41 correlation coefficients for

poverty and various types of violent crime, 32 (or 78%) were of at least moderate strength (>0.25). Using census data from 1970, 1980, and 1990, Wallace and Wallace (1998) found associations between socioeconomic status and both violent death incidence rates and the spatial density of intentional deaths in the Bronx, New York City.

While a majority of this research is conducted in the United States or Europe some documentation exists in the developing world. The relationship between psychological and physical intimate partner violence and various socioeconomic indicators has been found in Chile, Egypt, India and the Philippines (Bangdiwala et al., 2004). In this research, Bangdiwala and colleagues found that female education and household wealth (based on a derived asset index) were protective against intimate partner violence. In Brazil, Gianini and colleagues (1999) found an association between social class and victimisation of physical aggression in a hospital-based case-control study. This association remained when sex, age, marital status, smoking status, alcohol consumption and illicit drug use was controlled for.

In a non-representative qualitative study in Ghana, violence was found to be prevalent amongst educated, employed and married women and researchers suggested that the experience of violence may be greater and types of violence experienced may differ for women with lower socioeconomic position (Amoakohene, 2004). In South Africa, a cross-sectional study was conducted in three provinces to determine the prevalence of abuse of women and identify risk factors for these experiences. Researchers found that the victim's education was protective against abuse, but other measures of socioeconomic position (such

as household possessions, or partner's education or employment) were not significantly related to a woman's experience with domestic abuse (Jewkes et al., 2002).

3.0 METHODS

3.1 Study design

This research is a secondary analysis of cross-sectional data from the 1998 South African Demographic and Health Survey (SADHS).

3.2 Demographic and Health Surveys

The Demographic and Health Survey (DHS) is a representative nation-wide survey that was conducted for the first time in South Africa in 1998 through a collaborative effort between national and international governmental and not-for-profit organisations. Demographic and Health Surveys are administered internationally; nearly 200 surveys have been conducted in over 70 countries across Sub-Saharan and North Africa, Latin America and the Caribbean, Asia, and parts of Europe since 1984 (Measure DHS, 2005). The aim of the DHS is to assist countries in collecting and utilising data to monitor and evaluate population, health and nutrition policies and programmes. The DHS gathers data at the national and sub-national level on family planning, maternal and child health, child survival, HIV/AIDS/sexually transmitted infections (STIs), infectious diseases, reproductive health and nutrition as well as other health problems such as chronic diseases as determined by the country. The DHS is generally conducted every five years and the survey structure and many variables are similar

from country to country, which allows for national longitudinal data analysis, or the analysis of trends over time between different countries.

3.3 Sampling methods of the South African Demographic and Health Survey

All private households in South Africa were eligible for sampling selection. A two stage sampling design was structured to collect 12,000 complete questionnaires from a nationally representative sample of women aged 15-49 years. A further objective of the SADHS was to provide population-group specific estimates for this population. This resulted in an oversampling of the urban areas of KwaZulu-Natal (by 57%) and an oversampling of Gauteng (by less than 1%) to ensure that data was collected on enough Asian women to provide adequate estimates.

Each province was stratified by urban/non-urban areas, with the exception of the Eastern Cape that was first stratified by five health regions. This stratification resulted in 2 strata per province for all provinces except for the Eastern Cape (which had 10 strata) making for a total of 26 strata[1]. The sampling frame for the survey consisted of a list of approximately 86,000 enumerator areas (EAs) that was created by Statistics South Africa for the 1996 census. EAs that were exclusively institutional (made up of prisons and mining hostels for example) were excluded from the sampling frame.

The first stage of sampling was the selection of 972 primary sampling units (PSUs), which corresponded to the 1996 census EAs. Selection of PSUs was based on probability

[1] When accounting for this sampling design in analysis, the strata of the Eastern Cape were condensed into urban and rural only, as consistent with the other provinces and a total of 18 strata were used.

proportional to the number of visiting points[2] within the unit. Of these PSUs, 690 were from urban areas and 282 were from non-urban areas. In the second stage of sampling, 10 visiting points from each of the urban PSUs and 20 visiting points from each of the non-urban PSUs were selected for the survey. Each visiting point consisted of one, two, or three households. If a visiting point had two households, both were selected for an interview, if three households were present, one was chosen at random for the DHS interview.

This sample allocation was determined by the target number of women needed to adequately provide estimates for each province. This number was set at 9,000, with an additional 1,000 Asian women (from KwaZulu-Natal and Gauteng as mentioned) and an additional 2,000 women in the Eastern Cape as requested and paid for by the province. This made a final target of 12,000 women.

To determine the number of households to be selected within each stratum for each province to ensure 12,000 women were successfully interviewed the following equation was used:

X/YZ, where,

X= Target number of women aged 15-49 years

Y= Number of women aged 15-49 years per household

Z= Overall response rate

[2] Visiting points were demarcated during the 1996 census and are defined as a physical address or dwelling where a household or group of households can be found. Examples include a house, shack, vacant stand, hotel, a room in a hostel, shop, house under construction, hut, tent, or a block of flats or apartments. There may be more than one household at one visiting point.

The number of women aged 15-49 years per household was based the 1994 October Household Survey (resulting in an estimated number of 1.2) and the overall response rate was assumed to be 80%. Under these assumptions it was estimated that approximately 12,500 households in total would need to be sampled. Assuming that 10 households would be selected in each urban EA and 20 selected in each non-urban EA and then rearranging some of the distribution to ensure an even number of EAs within each stratum, the following selection of EAs was proposed:

Table 1: Proposed number of EAs to be selected, by Province

Province	Urban	Non-urban	Total
Western Cape	94	6	100
Eastern Cape	108	102	210
Health Region A	54	4	58
Health Region B	18	22	40
Health Region C	26	18	44
Health Region D	6	28	34
Health Region E	4	30	34
Northern Cape	74	16	90
Free State	74	16	90
KwaZulu-Natal	130	28	158
North-West	36	34	70
Gauteng	122	2	124
Mpumalanga	40	32	72
Northern	12	46	58
South Africa	690	282	972

Data Source: South Africa Demographic and Health Survey 1998: Full Report.

Of the 972 PSUs selected for the sample, three were not included due to interviewer safety concerns and three were not included due to loss of questionnaires, leaving 966 PSUs

represented in the data. For further detail on the sampling methodology refer to the full report of the 1998 South African Demographic and Health Survey (SADHS Full Report, 1998).

3.3.1 Questionnaires and response rates

The survey consisted of three questionnaires: the household questionnaire, the woman questionnaire, and the adult health questionnaire (all found in Appendix A). The household questionnaire was administered to every household selected through the sample allocation. Every woman between the ages of 15-49 years in these households answered the woman questionnaire. In every other household all people 15 years old and older answered the adult health questionnaire. Table 2 provides a summary of response rates and respondent characteristics by age and sex. Specific variables taken from each questionnaire are outlined and discussed in the next section.

Table 2: Sample sizes and characteristics

Questionnaire	Number eligible	Successfully interviewed	Response rate (adjusted)*	Population characteristics
Household questionnaire	12,860	12,247	96.9	All individuals, both sexes
Woman questionnaire	12, 327	11, 735	95.2	Women aged 15-49 years
Adult health questionnaire	14, 928	13,827	92.6	Adults aged 15 years and older in every other household

* This response rate is the adjusted rate once exclusions were made from the sample (for example if the household was absent during the entire interview period or the dwelling was vacant).

3.3.2 Pilot studies

Pilot studies for the SADHS were carried out in November 1996 in both urban and rural areas. Questionnaire instructions and questions were adjusted accordingly based on feedback from the pilots and translated into all official languages in South Africa (English, Afrikaans, isiXhosa, isiZulu, Sesotho, Setswana, Sepedi, SiSwati, TshiVenda, Xitsonga and isiNdebele).

3.4 Dependent variables: Specification and measurement

Two dependent variables from the SADHS are used in this analysis, one that provides information on the experience of violence at the individual level and one that examines violence at the household level. The survey questions (both from the household questionnaire) and adjustments made to the variable for this research are discussed below.

3.4.1 Individual level

The respondent of the household questionnaire answered an array of questions for each of the members in the household, including whether the member had experienced an injury that was treated by a doctor or nurse during the previous month. If yes, the type of injury experienced by the member was recorded. The questions (listed below) are numbers 13 and 14 respectively from the Household Schedule of the SADHS, and can be found in Appendix A.

> *13. Did (NAME) have any injury that was treated by a doctor or nurse during the last 30 days?*
>
> *14. IF INJURED IN LAST 1 MONTH... What type of injury did (NAME) have?*

Possible responses to this question included: assault in the home, political violence, other assault outside of home, self-inflicted violence, traffic collision, accident at work, sport, or other unintentional injury. For analysis, unintentional injuries (traffic collision, accident at work, sport, or other unintentional injury) were recoded as zero (no violence experienced in the past month). Owing to the small sample size, political violence (N= 1) was combined with violence outside the home.

After preliminary exploration of the sample experiencing self-inflicted violence, it was found that these individuals were not comparable to either those experiencing violence occurring inside or outside the home nor those who did not experience a violent injury. Differences in distributions of age, race, employment status, and education level were of particular concern for this analysis. This finding is supported in research on deaths due to suicide and homicide that have found distributions of the two types of violence to be significantly different with respect to race, age and alcohol involvement (Burrows et al., 2003; Lester, 1984). In light of these findings, reports of self-inflicted violence were excluded from the analysis (N= 23). It was anticipated that the inclusion of individuals who had suffered from self-inflicted violence in either group (those who experienced violence or those who did not) would lead to results that were difficult to interpret. As different risk factors are associated with self-inflicted injury versus interpersonal injury, inclusion of the former in the group that experienced violence would dilute observed effects of risk factors for violence. As people who had experienced self-inflicted injuries were not similar to those experiencing no violent injury, it could not be justified to include them in that population either. After these adjustments were made a total of 88 individuals had experienced violence in the past month and a binary outcome variable was created by combining violence outside the home and violence inside the home.

3.4.2 Household level

Unlike data on violent injuries, data collected with respect to deaths in the household did not include demographic information on the individual who had died. The respondent of the household questionnaire was asked if anyone in the household had died in the past 12 months, and if so, how many individuals had died from a violent injury. This question (listed below) is number 23 in the Household Schedule and can be found in Appendix A: Person, Women, and Household Questionnaires from the 1998 South African Demographic and Health Survey.

> *23. In the last 12 months, how many people in your household died from an injury sustained as a result of violence either between them and other people or from violence inflicted upon themselves?*

Responses to this question ranged from zero to three. Those reporting zero (N= 752) had deaths in the household that were due to unintentional injuries or natural deaths and were combined with households who had not experienced any death in the past year (N= 11,392). Households that experienced one to three deaths due to violence (N= 103) were grouped together to create a binary variable. It was not possible to separate deaths that were a result of interpersonal violence from those that were a result of self-inflicted violence due to the nature of the data.

3.5 Socioeconomic position: Specification and measurement

3.5.1 Absolute deprivation

3.5.1.1 Background

Traditionally the DHS does not collect information on income and expenditure due to the difficulty in asking these questions and the inevitable production of unreliable answers. Instead, many surveys include an asset index to measure the level of deprivation within households. Research has suggested that while indices derived from socio-demographic data are not accurate predictors of per capita expenditure, they are sufficient proxies for the differences in standards of living within a population and adequately explain health-related behaviour and conditions (Montgomery et al., 2000).

3.5.1.2 Development

As with many other countries where the DHS is conducted, an asset index derived from 55 socioeconomic variables within the survey was developed and used as a measure of absolute deprivation (for a complete listing of these variables see Appendix B). Each variable in the index is based on a conceptual theory that relates it directly to improving health status. Variables comprising the index are derived from nine questions in the household questionnaire regarding the main source of drinking water, type of toilet facility, fuel used for cooking/heating, number of rooms used for sleeping, main material of the floor and walls, household affordability, and ownership of specific material items.

Each variable was recorded and coded in parallel to the World Bank methodology and entered into a rotated multi-factor analysis, which is a common analytic technique for index

development (Booysen, 2001). With this process there is an underlying assumption that households that are consistently wealthy will have similar patterns of asset variables (Booysen, 2001). When entered into a factor analysis 14 variables received loadings greater than |0.50| (electricity; ownership of television, refrigerator, car, telephone, washing machine; uses electricity or wood for cooking/heating; presence of piped drinking water in dwelling; has own flush toilet, earth floors, mud or plastered walls; and family members never go hungry). These variables were combined and divided into five population quintiles to create the primary index used by the Medical Research Council (MRC) in their Burden of Disease studies (Rosana Norman, personal communication).

The full asset index was tested for internal coherence and nearly all asset variables consistently showed sharp contrasts between socioeconomic groups, which were defined as the bottom 40% middle 40% and richest 20% of the population. The index was also tested for robustness. When the 14-variable index was compared with the full index (using the Spearman's rank order correlation coefficient) it was found that 89% of the variability within the full index was due to its relationship with the alternative 14 variable index. This correlation was significant at the 99% confidence level (Booysen, 2001). For a comparison of the 14-variable index with the full index (using 55 variables) with respect to the bottom 40% middle 40% and richest 20% of the South African population see Table 3.

Table 3: Differences in the classification of households on the full index and the index with variables with factor loadings >|0.50|

Full asset index	Index with variables with factor loadings >|0.50|		
	Bottom 40%	Middle 40%	Richest 20%
Bottom 40%	89.0	11.0	0.0
Middle 40%	10.4	84.9	4.7
Richest 20%	0.0	15.3	84.7

Data Source: Booysen F. (2001). Chapter 2: The Measurement of Poverty. In: Bradshaw D and Steyn K (eds.) Poverty and Chronic Diseases in South Africa: Technical Report 2001.

It should be noted that the full index fared similarly with two other indices derived from variables based on ownership variables or housing infrastructure, exemplifying the robustness of the overall index. Finally, the effectiveness of the index as a proxy for socioeconomic position has been tested. High correlation with traditional measures of poverty was found when the asset index value at the 40th population percentile (using the full index) was used as the poverty line. Using Spearman's correlation coefficients to determine the rank order correlation between provincial poverty estimates, Booysen (2001) found that the poverty level set by the index was highly correlated with PPP$1 per person per day[3] using data from the 1995 Income and Expenditure Survey (correlation coefficient 0.767; $p<0.05$), as well as with poverty lines set at R800/month/hh and R950/month/hh (0.867; $p<0.01$ and 0.950; $p<0.01$ respectively) using the 1996 Census data. For a complete description of this methodology refer to Booysen (2001).

[3] Purchasing Power Parity (PPP) is a way to compare the costs of goods and services between countries, in this case between the United States and South Africa. PPP$1 per capita per day is an internationally comparable poverty line.

3.5.1.3 Applicability to South Africa

As a measure of socioeconomic position in the use of the asset index may be more appropriate than the traditional components of income, employment, occupation or education. The historical racial division in South Africa significantly limited education and employment opportunities for a majority of the population in the past, yet current employment may enable households to attain goods as specified in the index and increase financial status within the community. A large proportion of the population in South Africa may also be without employment or a cash income and sharing resources and informal trade among neighbours is common, making income an ineffective measure of accessible goods and services (Myer et al., 2004).

3.5.1.4 Format for analysis

As mentioned, the 14-variable index is used throughout research conducted by the MRC and therefore it is the format used in the current research. For ease in interpretation the index is used as a categorical variable in the form of population quintiles.

3.5.1.5 Missing information

Asset index values for the household were only calculated when data was available for all variables that comprise the index. This resulted in the generation of an index for 98% (N= 12,017) of households interviewed. Of the households for which the asset index was not calculated, two had a violent death and one household had two violent deaths in it over the past year.

3.5.2 Employment

Information on employment status was gathered on all individuals aged 10 years and older (N= 39,008). The variable is binary and employment is defined as having worked for payment in the past seven days. Both individual employment and employment of the head of household are used as independent variables for individual and household level analyses, respectively.

3.5.3 Education

Education is used as a proxy for socioeconomic position in many settings, although may not be relevant in the South African context where under the apartheid regime a majority of the population was denied access to formal education. Educational attainment was gathered for all individuals (N=52,906). Education for both the individual and head of the household is a continuous variable.[4]

3.6 Individual level risk factors: Specification and measurement

The following individual level variables from the DHS were considered risk factors and therefore controlled for in the analyses of violent injuries to reduce the possibility of observed associations being due to confounding:

In the full- analysis

- Age *(continuous)*
- Sex *(categorical)*

[4] Years of education ranged from 0-15, where 1= subA/class1, 2=subB/class2, 3=Standard1, 4=Standard2, 5=Standard3, 6=Standard4, 7=Standard5, 8=Standard6, 9=Standard7, 10=Standard8, 11=Standard9, 12=Standard10, 13=further studies incomplete, 14=diploma/other postschool complete, 15=further degree incomplete.

- Race *(categorical)*

In sub-analyses

- Risky alcohol consumption *(binary)*

  CAGE is an internationally used assessment tool for identifying alcoholics. The acronym stands for the questions utilised by the measure: cut down on drinking – have tried repeatedly without success; annoyed by criticism about drinking habits; guilty feelings about drinking; and, eye opener drink needed in the morning. Affirmative responses to two or more of the CAGE questions indicate an individual who is 'at-risk' for alcoholism (Buchsbaum et al., 1991).

  The CAGE questions are numbers 90-93 in the Adult Health Questionnaire, found in Appendix A and listed below.

  90. Have you ever felt that you should cut down on your drinking?

  91. Have people annoyed you by criticizing your drinking?

  92. Have you ever felt bad or guilty about your drinking?

  93. Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?

- Medical coverage through an insurance scheme *(binary)*

  To ensure that the individual level dependent variable was not confounded by the victim's ability to receive medical care from a doctor or nurse, information on medical

coverage was assessed. This was question number 4 from the Adult Health Questionnaire, found in Appendix A and listed below.

4. *Are you covered by a Medical Aid or Medical Benefit Scheme? (Any scheme that helps you pay for health/drug services).*

Table 4 provides a summary of all variables used in individual level analyses, indicates the questionnaire from which they came and the number of people eligible for the question. As illustrated, variables differ in number of respondents due to the different sample sizes associated with each questionnaire and the number of people for whom the question was applicable within each sample.

Table 4: Summary of variables used in individual level analyses

Dependent variable	Questionnaire	Number of respondents
Violent injury	Household	52,883
Socioeconomic position variables		
Asset index	Household	51,909
Employment (ages 10 years+)	Household	39,008
Education	Household	52,491
Full-analyses demographic variables		
Age	Household	52,875
Sex	Household	52,874
Race	Adult/Woman	47,091
Sub-analyses risk factors		
Risky alcohol consumption	Adult	13,789
Medical coverage	Adult	13,789

3.6.1 Race methodology and assumptions made

Historically in South Africa, race was ascribed to individuals by population groups defined by the apartheid system and therefore had four categories. 'African' refers to people whose place of origin is the African continent; 'White' refers to Caucasians of European ancestry; 'Coloured' is unique to South Africa and includes people who are of mixed Khoi, San, Malay, European and African ancestry; and 'Asian/Indian' refers to individuals from East Asian and the Indian subcontinent (Norman et al., 2001).

The adult health questionnaire and the woman questionnaire collected information on the respondent's race, the former capturing 5,738 men and 8,073 women and the latter providing data for 11,735 women. Due to the overlap of women aged 15-49 years answering both surveys, race was collected on a total of 14,206 women, making a total of 19,944 accounts of reported race.

Of the 5,562 women aged 15-49 years who answered the adult and woman questionnaires, 33 had contradictory reports of race between the two surveys. The race variables for these 33 observations were examined alongside the home language of the respondent from the adult data set. When the primary language spoken at home was an African language, Black/African was used for the individual's race (N= 5). With the exception of the previous instance, in a discrepancy involving an Asian response, Asian was chosen as the race (N= 9) due to the small numbers of Asian people in the data set. The race was chosen to be Coloured if Afrikaans was the primary language spoken (N= 6) and the alternative race was chosen if English was the primary language (N= 1). Table 5 records the assumptions made in the process for 'assigning' race to these 33 observations as well as the number of observations affected by these assumptions:

Table 5: Process for assigning race to 33 inconsistent observations

Language	Recorded races	Race chosen	Number of observations
English	Black/Af., Coloured	Black	5
English	Asian, Coloured	Asian	7
English	Asian, Black	Asian	2
English	White, Coloured	White	1
Afrikaans	Coloured, White	Coloured	1
Afrikaans	Coloured, Black/Af.	Coloured	5

The original 19,944 race observations increased to 47,091 under the assumption that households are racially homogenous. If race data was collected from one member in the household, the rest of the household was assigned that race. If race data was collected on more than one member, race was assigned to remaining members *only* if the originally recorded races were the same (so the assumption of a racially homogenous household applied). Races were not assigned to other members if original race data within a household proved the household racially heterogeneous.

The reason for increasing the data on race was due to the drastic (50%) reduction in the number of reported experiences of violence if the original 19,944 records of race were used. Table 6 provides information on the missing accounts of violence with respect to both data sets, the original race dataset and the second data set when the homogenous household assumption was applied.

Table 6: Number of injuries/deaths due to violence, by dataset

Individual level: Injuries due to violence

	Full dataset (N= 52,906)	Original race dataset (N= 19,994)		Assumed race dataset (N= 47,091)	
Experienced a violent injury	N	N	% of total	N	% of total
No	52,795	19,893	37.7	46,996	88.8
Yes	88	44	50.0	76	86.4
Total	52,883	19,937	37.7	47,027	88.9

Household level: Number of deaths due to violence by race of household head

	Full dataset (N= 12,247)	Original race dataset (N= 6,688)		Assumed race dataset (N= 10,320)	
Number of violent deaths	N	N	% of total	N	% of total
1	95	46	48.4	78	82.1
2	7	5	71.4	6	85.7
3	1	0	0	1	100
Total deaths	103	55	53.4	85	82.5

3.7 Household level risk factors: Specification and measurement

Variables in the analyses at the household level (as risk factors or to control for confounding) include:

- Sex of head of household *(binary)*
- Age of head of household *(continuous)*
- Race of head of household *(categorical)*
- Number of household members *(continuous)*
- Enumerator area type *(categorical)*

This variable is a classification of EAs by human settlement type. Fifteen such types were designated in 1996 for the population census. The assignment of an EA to a particular classification was based on its geographic location (rural, semi-urban or urban) as well as the type of structures located within the EA (for example formal structures, semi-formal structures, hostels, institutions, or informal dwellings). For the purposes of this analysis EA types were used in their collapsed form of five categories: urban formal, urban informal, commercial farms, tribal authority areas, and other non-urban areas.

Table 7 provides a summary of all variables used in the household level analysis, indicates the questionnaire from which the variable came from and the number of households for which there is data.

Table 7: Summary of variables used in household level analyses

Dependent variable	Questionnaire	Number of households
Violent death	Household	12,247
Socioeconomic position variables		
Asset index	Household	12,017
Employment of head	Household	12,247
Education of head	Household	12,247
Risk factors		
Age of head	Household	12,247
Sex of head	Household	12,247
Race of head	Adult/Women	10,320
Number of household members	Household	12,247
EA type	Household	12,247

3.8 Quality control

Quality control measures were built into the SADHS at three levels:

1) Field team leaders were trained to identify enumerator areas included in the sample and guide interviewers in the selection of households for interviews;

2) Approximately 10% of the sample was re-visited while the study was taking place to ensure that appropriate households were selected and interviews were carried out; and,

3) A team of staff from the Human Sciences Research Council conducted independent quality control visits to check questionnaires for errors, quality of identification and interviews at the EA and household levels.

Data were cleaned and processed at the MRC in Cape Town. Information was checked for consistency and completeness and open-ended questions were coded. Incomplete questionnaires were returned for missing data to be completed. To ensure quality control of analysis methods, analyses were checked periodically with published DHS data tables (Bradshaw and Steyn, 2001; SADHS Full Report, 1998).

3.9 Statistical methods

3.9.1 Application of weights to the data sets

Due to the stratified sampling design, clustering and oversampling in some provinces, the Medical Research Council developed and applied weighting factors to the data to ensure that results were representative to the national population. In the data set the sample weight is either a seven or eight digit variable. When used in the analysis it was first divided by 1,000,000, as recommended by the MRC. All sample weights are normalised to ensure that the weighted number of cases is identical to the unweighted number of cases when using the full dataset with no selection. For self-weighting samples this variable is equal to 1,000,000.

For multivariate analysis survey weights were set based on the strata (defined by urban/rural location and province), the primary sampling unit (which corresponded to the EA number) and the sampling weight that was unique for each data set (corresponding to the household,

adult, or woman questionnaire). When variables used in the analysis came from different questionnaires, the weight from questionnaire containing the variable with the fewest observations was used.

3.9.2 Preliminary analysis

The primary objective of data analysis was to identify risk factors for violence at the individual and household levels and determine which indicators of socioeconomic position best explain the high rates of violence in South Africa. To address this question, data were analysed using the statistical programme Stata Version 8.0 (College Station, Texas, USA). It is important to note that because of the survey design (and hence survey analysis using the *svy* command in Stata) results are not presented in absolute numbers as is traditional in epidemiological research presentations. All results are weighted percentages and therefore 95% confidence intervals around these percentages will be used to indicate precision of the estimated proportions, means or associations. In some instances the absolute number of study respondents will be included to indicate the numbers of observations included in the analysis, as the total number of reports of violence varies with different subpopulations formed by the inclusion of particular variables. This was demonstrated in Table 6, as the number of violent injuries or deaths reported varied depending on whether the original race data set, or assumed race data set was used.

Relevant variables including the weighting variable from the three questionnaires were merged to create one dataset. Preliminary data analysis consisted of computing and interpreting descriptive statistics for each variable of interest. Frequency tables with chi-

square tests of significance were used to assess the bivariate associations between each set of exposure and outcome variables. The same analysis was used to assess potential covariate-exposure and covariate-disease relationships to identify potential confounders for the model building stage of analysis (Raudenbush and Bryk, 2002).

The initial outcome of interest included self-inflicted violence. As stated previously, it was decided to drop these observations from the analysis (N= 23) due to the different risk factors associated with this phenomenon than violence occurring outside or inside the home. Analyses were then rerun using 88 reports of violence rather than 111.

3.9.3 Multivariate models

Multivariate analyses used adaptations of maximum likelihood estimation format for surveyed data, through the use of *svylogit* commands. Models were developed to predict the individual experience of violence as well as household experience of violence, using logit transformations and binomial errors.

Automated model building procedures (forward, backward or stepwise regression) are not supported by survey analysis and are not used for any of the analysis. Due to the sociological nature of both the outcome and risk factors related to violence, automated building procedures are not optimal. These procedures do not allow for manual inclusion or exclusion of variables and therefore can result in models that are not conceptually sound. This was particularly important in the early stages of model building and analysis, when a wide range of potential confounding variables and risk factors were considered and analyses were run separately for

men and women, who not only have different experiences of violence, but different risk factors leading to these experiences. A controlled model building procedure was utilised to ensure that key confounding variables were included in the analysis and varying hypotheses around mediation could be explored.

The same model building procedure was utilised for individual level and household level outcomes. Employment (of an individual or head of household) and wealth of the household (as measured by the asset index) were the key independent variables for either outcome. Each model originated with the bivariate association between an independent variable and the outcome. Known demographic confounding variables were then added to the model individually (for example sex, age and race). The third step was to assess the association between the original measure of socioeconomic position and violence once other measures of socioeconomic position were added to the model (education and either employment or the asset index for example). Risky drinking behaviour was a significant risk factor for violence and was added to most models as well (Raudenbush and Bryk, 2002).

Standard model diagnostic procedures adapted for multivariate models (Hox, 2002; Raudenbush and Bryk, 2002) cannot be applied to survey data using Stata 8, therefore the adequacy of model fit and other diagnostic procedures such as assessing the normality and variance of residuals could not be assessed. Analysis of influence through the removal of specific cases or observations (Rothman and Greenland, 1998) would not have been useful, due to the small number of cases of violence (N= 88 injuries, 103 households with deaths); the removal of any would have altered results drastically.

All results are presented at either the individual or household level as proportions with 95% confidence intervals or p-values or odds ratios with 95% confidence intervals. All statistical tests are two-sided at α=0.05.

3.10 Ethics

Data collected from the SADHS are unlinked and anonymous. The identities of all human subjects are not known and there was not be any attempt to contact households or residents in specific geographic areas where the interviews took place. Presented research does not associate results with any specific communities in South Africa. The SADHS protocol was approved by the research ethics committee of the South African Medical Research Council and by the National Department of Health. Owing to the extensive review by multiple committees of the primary project, the ethics review for secondary analysis of the SADHS was further granted by the School of Public Health and Family Medicine at the University of Cape Town.

4.0 RESULTS

4.1 Individual level analyses

4.1.1 Description of the individual sample

Table 8 provides both the crude distribution and crude adjusted distribution (that takes sampling stratification and clustering into effect) of the SADHS sample population by the dependent variable and individual level socioeconomic and demographic variables used in the analysis. The population size is approximately 52,906 unless otherwise noted.

After adjusting for the sampling strategy, 0.16% (N= 88) of the sampled population had seen a doctor or nurse because of a violent injury in the previous 30 days. When people with self-inflicted injuries were excluded from the sample, 20% of all sustained injuries in the month prior to the survey were due to violence. Approximately 27% of people age 10 and older had worked for payment in the past week and just fewer than 40% of all people had schooling above the primary level. The study population was 53% female and 80% Black/African. Nearly two-thirds (65%) of the study sample was below the age of 30. Seventeen percent of adults were considered to be high-risk alcohol users as determined by the CAGE questionnaire.

Table 8: Description of individual level study sample

	Crude %	Crude % (95% CI) (adj. for sampling)
Dependent variable		
Violence outside the home (N=31)	0.11	0.11 (0.09, 0.15)
Violence inside the home (N=57)	0.06	0.04 (0.03, 0.07)
Total interpersonal violence (N=88)	0.17	0.16 (0.12, 0.20)
Measures of socioeconomic position		
Worked in the past 7 days (N=39,008)	25.56	27.45 (26.37, 28.56)
Highest level of schooling was Primary level or less	63.13	60.85 (59.79, 61.91)
Demographic variables used in primary analyses		
Male	46.75	46.74 (46.25, 47.23)
Age group (years)		
0-19	48.66	47.72 (47.04, 48.40)
20-29	14.80	15.23 (14.79, 15.67)
30-39	11.60	12.13 (11.74, 12.53)
40-49	8.35	8.71 (8.36, 9.08)
50-59	7.48	7.50 (7.17, 7.84)
60+	9.12	8.72 (8.33, 9.13)
Race (N= 47,091)		
Black/African	78.52	79.66 (77.64, 81.55)
Coloured	12.30	9.97 (8.62, 11.49)
White	6.15	7.24 (6.11, 5.57)
Asian/Indian	3.03	3.13 (2.38, 4.10)
Risk factors used in sub-analyses		
Risky drinking behaviour (N=13,827)	18.51	17.14 (16.20, 18.12)
Medical aid coverage (N= 13,780)	14.80	17.05 (16.27, 17.87)

Crude: Unadjusted rate that does not take sampling strategy into account; Crude adj: Adjusted rate that takes sampling strategy into account using the *svy* command in Stata; CI: Confidence interval.

4.1.2 Bivariate associations at the individual level

Eighty-eight people had received a violent injury occurring either inside or outside the home in the month prior to the interview. The overall monthly violent injury rate in South Africa averaged 158/100,000 people (95% CI: 123/100,000, 203/100,000). An individual's experience of violence was significantly correlated with being male, increasing age, increasing education, alcohol use and employment.

Table 9 presents bivariate associations between risk factors at the individual level and the experience of a violent injury in the past 30 days. The question measuring the dependent variable specifies only violent injuries that required medical treatment by a doctor or a nurse, therefore, involvement in a medical aid scheme was assessed as a potential confounder. However, this variable was not correlated with receiving medical treatment for an injury due to violence ($p= 0.368$). As information on some variables was only gathered on a portion of the sample population, the number of violent incidences occurring within these subsets is provided. Following Table 9 are monthly injury rates, by risk factor.

Table 9: Individual level risk factors for experiencing a violent injury

Risk factor	# of violent incidents	No violence	Any violence	p-value
		Mean		
Age	88	26.30	30.04	0.021
Education (in years)	88	5.71	6.82	0.039
		%		
Male	88	46.71	65.30	0.003
Race (N= 47,091)	76			0.320
Black/African	53	79.66	77.57	0.673
Coloured	19	9.96	16.44	0.068
Indian/Asian	0	3.14	0	0.343
White	4	7.25	5.99	0.699
Employed (N= 38,992)	76	27.42	41.32	0.015
Risky drinking (N= 13,784)	34	17.08	33.22	0.017
Involvement in a medical aid scheme (N= 13,775)	34	17.06	10.49	0.283

P-value for Pearson's chi-square test of homogeneity

Sex

Males were almost twice as likely to experience violence as females. The monthly violent injury rate for men was 103/100,000 whereas the rate for women was 55/100,000 (p= 0.003).

Age

Children (under the age of 15 years) were significantly less likely to have experienced an injury due to violence than adults (50/100,000 vs. 223/100,000, p<0.001). The monthly

violent injury rate was 368/100,000 for people aged 30-39 years making this age group the most at risk in the sample population ($p<0.001$)[5].

Race

Race was not observed to have an effect on rates of violence. 0.25% of the Coloured population experienced violence, compared to 0.15% of Black/Africans, and 0.13% of Whites ($p= 0.320$). There were not any reports of violent injuries within the Indian/Asian population. For the remainder of the analyses this race category was grouped with the White population.

Education

The violent injury rate for the population with a secondary level of education was 210/100,000. This was the highest rate of the four education categories; those with no schooling experienced violence at a rate of 100/100,000 and people with primary level education or higher education experienced violence at a rate of 150/100,000 ($p= 0.297$).

Work in past seven days

The monthly violent injury rate for people aged ten years and older who worked during the week prior to the interview was 281/100,000. This is almost twice as high as the rate for those who did not work (151/100,000, $p= 0.015$).

Alcohol use (at-risk drinking)

Of the adults (aged 15 years and older) who answered the adult health questionnaire (N= 13,827), people who were considered to either previously or currently abuse alcohol

[5] Age increments for this comparison are as follows (in years): 15-19, 20-29, 30-39, 40-49, 50-59, 60+

experienced violence at a monthly rate of 466/100,000. People who had never drank or drank more responsibly had a significantly lower violent injury rate (193/100,000, p= 0.017).

Asset index (by quintiles)

Table 10 shows the distribution of violent injuries by the asset index. Reported incidences of violence were distributed across the index. The richest quintile was slightly less likely to experience violence (0.118%), than the poorest quintile (0.178%), although the difference was not significant (p= 0.868).

Table 10: Distribution of violent injuries by asset index

Asset quintile	Number of injuries	Injury rate (95% CI) (per 100,000)
1	18	178 (77, 277)
2	17	155 (66, 244)
3	20	175 (91, 259)
4	19	173 (65, 280)
5	12	118 (44, 192)

CI: Confidence interval

Sex of head of household

People living in a female-headed household experienced violence at a slightly higher rate than those living in a male-headed household, although the difference is not significant (179/100,000 vs. 142/100,000, p= 0.376).

Urban/rural location

People living in an urban residence were more likely to experience violence, although the difference was not significant at the 5% level (186/100,000 vs. 124/100,000, p= 0.118). Individuals living in informal urban settlements, or 'squatter areas', experienced the highest rate of violence when compared to those living in other areas. This group experienced a

monthly violence rate of 339/100,000, significantly higher than the rates of 158/100,000 experienced by those in formal urban areas, 65/100,000 for people on commercial farms, 132/100,000 for tribal areas, and 124/100,000 for other rural areas (p= 0.032)

4.1.3 Bivariate sub analyses: Violence inside versus outside the home

Stratified analyses were used to examine the location of violence, taking place either inside or outside the home. Table 11 presents these associations (see below).

For violence occurring inside the home, associations with individual level risk factors were weak and often not significant at the 5% significance level. Age was found to be a significant risk factor; as age increased by one year, there was an increased risk of experiencing violence inside the home of 1.0% (95% CI: 0.03%, 2.0%). Point estimates showed that being male, having worked for payment in the last week or engaging in risky drinking behaviour were protective against violence inside the home, however, none of these associations were significant, with employment and alcohol use having large standard errors.

Employment of the head of household and living in the richest segment of the population (based on the asset index) were significant protective factors against violence occurring inside the home. The odds ratios for these variables were 0.22 (95% CI: 0.08, 0.63) and 0.06 (95% CI: 0.01, 0.47) respectively. As family size increased by one member an individual was significantly less likely to have experienced violence inside the home in the past month (OR= 0.74; 95% CI: 0.62, 0.89).

Individual level risk factors had a higher correlation with violence occurring outside the home than inside. Violence taking place outside of the home was strongly and significantly associated with being male (OR=3.49; 95% CI: 1.77, 6.86), being employed (OR= 2.58; 95% CI: 1.38, 4.80) and engaging in risky drinking behaviour, either currently or previously (OR= 3.39; 95% CI: 1.39, 8.22). As educational attainment increased by one year, the risk of experiencing violence increased by 7% (95% CI: 1%, 13%). When compared to the Black/African sample population, the Coloured population was at a greater risk of experiencing violence outside the home, although the association was not significant at the 5% level (OR=1.91; 95% CI: 0.90, 4.04). No risk factors at the household level were found to be significant. Multivariate analyses were not conducted due to the small number of cases in each strata that were further reduced with the introduction of certain variables collected on a subset of the overall sample population (such as race or alcohol use).

Table 11: Bivariate associations between risk factors and violence inside/outside the home

Variable	Violence inside the home (N= 31)		Violence outside the home (N= 57)	
	Crude OR	**95% CI**	**Crude OR**	**95% CI**
Individual characteristics*				
Male	0.76	(0.34, 1.67)	3.49	(1.77, 6.86)
Age	1.01	(1.00, 1.02)	1.01	(0.999, 1.02)
Employed	0.67	(0.24, 1.87)	2.58	(1.38, 4.80)
Education	1.02	(0.92, 1.14)	1.07	(1.01, 1.13)
Coloured (N= 47,047)**	-	-	1.91	(0.90, 4.04)
White/Asian	-	-	0.85	(0.29, 2.46)
Risky alcohol use (N= 13,774)	0.85	(0.17, 4.29)	3.39	(1.39, 8.22)
Household characteristics				
Male head	0.81	(0.32, 2.04)	0.78	(0.43, 1.41)
Age of head	0.98	(0.95, 1.01)	1.00	(0.98, 1.02)
Head is employed	0.22	(0.08, 0.63)	1.06	(0.59, 1.92)
Education of head	1.03	(0.93, 1.13)	1.01	(0.95, 1.07)
Asset index				
1st quintile of index	1.0	-	1.0	-
2nd quintile of index***	1.55	(0.44, 5.43)	0.67	(0.25, 1.81)
3rd quintile of index	1.62	(0.54, 4.81)	0.80	(0.33, 1.90)
4th quintile of index	1.19	(0.31, 4.61)	0.90	(0.36, 2.30)
5th quintile of index	0.06	(0.01, 0.47)	0.85	(0.33, 2.14)
Family size	0.74	(0.62, 0.89)	0.98	(0.87, 1.12)
Urban location	1.40	(0.55, 3.53)	1.54	(0.84, 2.82)

OR: Odds ratio; CI: Confidence interval * The sample size is 52,906 unless otherwise noted
Black/African is used as the reference category. Sample size was too small to conduct the analysis for violence occurring inside the home. * Quintile 1 (the poorest group) is used as the reference category.

4.1.4 Multivariate associations

Table 12 explores the effect of household wealth (as measured by the asset index) on individual experience of violence. The crude measure of effect is provided; an odds ratio and 95% confidence level displaying the association between increasing levels of household wealth when compared to the poorest quintile. None of these crude associations were significant, and a trend did not emerge. Model 1 examined the effect of household wealth on violent injury while controlling for the effect of age, sex, and race. Being male and Coloured were significant risk factors at the 95% confidence level. Model 2 added other potentially competing socioeconomic variables (education and work status of the individual) to the model. Belonging to the wealthiest quintile became a significant protective factor against violence and employment became a risk factor for the experience of violence. Those who were employed were nearly twice as likely to experience violence as those who were not employed (OR=1.83; 95% CI: 0.99, 3.38). Finally, Model 3 controlled for the abuse of alcohol and examined the effect of the asset index amongst this sample population of adults in every other household. Age and the wealthiest quintile were protective factors against violence in this model. The effect of the asset index on the experience of violence most closely resembled an inverse trend- as wealth increased, the occurrence of violence decreased.

Table 12: Multivariate analysis of the association between household wealth and individual experience of violence

Model variables	Number of injuries*	Crude OR (95% CI) N= 51,888	Model 1 (95% CI) N= 46,129	Model 2 (95% CI) N= 33,367	Model 3 (95% CI) N= 13,172
Asset index					
1st quintile	18/86	1	1	1	1
2nd quintile	17/86	0.87 (0.40, 1.92)	0.84 (0.35, 2.05)	0.62 (0.24, 1.61)	0.41 (0.12, 1.37)
3rd quintile	20/86	0.99 (0.49, 2.00)	1.04 (0.48, 2.28)	0.66 (0.29, 1.50)	0.43 (0.16, 1.12)
4th quintile	19/86	0.97 (0.42, 2.22)	1.01 (0.38, 2.66)	0.56 (0.19, 1.62)	0.35 (0.10, 1.23)
5th quintile	12/86	0.66 (0.29, 1.53)	0.60 (0.24, 2.66)	0.32 (0.12, 0.89)	0.17 (0.05, 0.61)
Age	88/88		1.01 (1.00, 1.01)	0.99 (0.98, 1.00)	0.96 (0.93, 0.996)
Male	54/88		2.76 (1.59, 4.80)	2.49 (1.37, 4.54)	1.72 (0.69, 4.33)
Coloured**	19/76		1.95 (1.00, 3.82)	1.94 (0.95, 3.96)	0.79 (0.24, 2.65)
White/Asian	4/76		0.81 (0.26, 2.50)	0.47 (0.13, 1.68)	0.80 (0.17, 3.81)
Education	88/88			1.08 (0.99, 1.18)	1.04 (0.90, 1.20)
Employed	28/76			1.83 (0.99, 3.38)	1.40 (0.71, 2.74)
Alcohol abuse	12/34				2.29 (0.98, 5.37)

OR: Odds ratio; CI: Confidence interval
* Note that this ratio is the number of injured individuals falling into that category of the variable (for example the 1st quintile of the asset index) over the total number of injured individuals for that variable (the asset index overall). The denominator continues to change due to different sample sizes used in data collection for various variables.
** Black/African is the reference category

Table 13 displays the models generated to explore the effect of employment on the individual experience of violence. In the simple association, employed individuals had an 86% higher risk of experiencing violence than those that did not work for payment in the week prior to the interview. This effect became stronger once individual demographics were controlled for (Model 1). When the other measures of socioeconomic position (household wealth and

education) were added to the model (Model 2), employment no longer remained a significant risk factor at the 5% level (OR=1.83; 95% CI: 0.99, 3.38). This effect was further diminished when alcohol use was controlled for and the sample was limited to adults in every other household.

Table 13: Multivariate analysis of the effect of employment on individual experience of violence

Model variables	Number of injuries*	Crude OR (95% CI) N= 38,992	Model 1 (95% CI) N= 34,262	Model 2 (95% CI) N= 33,367	Model 3 (95% CI) N= 13,172
Employed	28/76	1.86 (1.12, 3.11)	2.09 (1.18, 3.70)	1.83 (0.99, 3.38)	1.40 (0.71, 2.74)
Age			0.987 (0.976, 0.999)	0.99 (0.98, 1.00)	0.96 (0.93, 0.996)
Male	54/88		2.25 (1.27, 3.98)	2.49 (1.37, 4.54)	1.72 (0.69, 4.33)
Coloured**	19/76		1.34 (0.66, 2.71)	1.94 (0.95, 3.96)	0.79 (0.24, 2.65)
White/Asian	4/76		0.33 (0.10, 1.09)	0.47 (0.13, 1.68)	0.80 (0.17, 3.81)
Education				1.08 (0.99, 1.18)	1.04 (0.90, 1.20)
Asset index***					
2nd quintile	17/86			0.62 (0.24, 1.61)	0.41 (0.12, 1.37)
3rd quintile	20/86			0.66 (0.29, 1.50)	0.43 (0.16, 1.12)
4th quintile	19/86			0.56 (0.19, 1.62)	0.35 (0.10, 1.23)
5th quintile	12/86			0.32 (0.12, 0.89)	0.17 (0.05, 0.61)
Alcohol abuse	12/34				2.29 (0.98, 5.37)

OR: Odds ratio; CI: Confidence interval
* Note that this ratio is the number of injured individuals falling into that category of the variable (for example the 1st quintile of the asset index) over the total number of injured individuals for that variable (the asset index overall). The denominator continues to change due to different sample sizes used in data collection for various variables.
** Black/African is the reference category
*** The 1st quintile (the poorest group) is the reference category

4.2 Household level analyses

4.2.1 Description of the household sample

Overall, 0.89% (95% CI: 0.71%, 1.11%; N= 103) of households sampled in the SADHS had experienced one or more deaths due to violence in the past year. Of those households experiencing any death in the past year (N= 883), 12% had one or more violent deaths, 16% had one or more deaths due to unintentional injuries (such as motor vehicle accidents, fall, or burns) and the remainder were due to natural causes. 1.53% of all households had experienced either one or more violent deaths in the previous year, one or more members who experienced a violent injury in the previous month, or both. See Table 14 for a distribution of households by the number of violent deaths and injuries experienced in the past year/month.

Table 14: Number of households experiencing violent deaths/injuries

Number of violent deaths in household	Number of violent injuries			Total
	0	1	2	
0	12,060	82	2	12,144
1	93	2	-	95
2	7	-	-	7
3	1	-	-	1
Total	101	84	2	12,247

A total of 40% (95% CI: 29%, 53%) of households experiencing a violent death lived in the 4th quintile (the second wealthiest) of the asset index. Comparatively, nearly a quarter (24%) fell within the 2nd quintile, 17% were in the 1st, 13% in the 3rd, and 6% in the 5th, indicating no trend association between household wealth and it's experience with a death due to violence.

Table 15 provides descriptions of the sampled households (N=12,247), by the dependent variable and household level measures of socioeconomic position and risk factors used in the analysis. Both the crude percentage and crude percentage adjusted for the sampling strategy are listed. Over half of the household heads either had no education or primary level only, over 40% were female-headed, and 46% had worked in the previous week. Seventy-seven percent of households were Black/African, with equal distribution of White and Coloured households (10% each), the remainder (3%) being Asian/Indian. Nearly half of the households were in urban formal areas, with the second largest area being those of tribal authority (32%). Ten percent of households had eight or more members.

Table 15: Description of household sample

Variable (N= 12,247)	Crude %	Crude % adjusted for sampling (95% CI)
Dependent variables		
Experienced a death due to violence in the past year (N= 103)	0.84	0.89 (0.71, 1.11)
Experienced a violent death/injury in the past year/month (N= 187)	1.53	1.53 (1.29, 1.81)
Measures of socioeconomic position		
Household asset index (Quintiles) (N= 12,017)		
1	18.76	14.84 (13.56, 16.22)
2	21.28	21.52 (19.96, 23.16)
3	19.96	19.29 (17.86, 20.79)
4	19.67	20.74 (19.22, 22.34)
5	20.33	23.62 (21.76, 25.58)
Head of household worked in the past 7 days (N= 12,030)	43.11	45.98 (44.26, 47.71)
Head of household had primary level education or less	53.86	51.15 (49.63, 52.66)
Demographic variables		
Female headed household	42.68	41.86 (40.56, 43.18)
Race (N= 10,320)		
Black/African	75.89	77.05 (74.96, 79.01)
Coloured	12.34	9.89 (8.56, 11.28)
White	8.64	9.84 (8.39, 11.51)
Asian/Indian	3.12	3.23 (2.47, 4.21)
Enumerator Area Type		

Urban formal	46.53	49.38 (47.34, 51.42)
Urban informal	8.30	9.63 (7.91, 11.68)
Commercial farm	7.38	5.81 (4.30, 7.81)
Tribal area	34.45	31.90 (29.85, 34.01)
Other non-urban areas	3.33	3.28 (1.96, 5.46)
	Mean	
Age of head of household	49.06	48.51 (48.03, 48.98)
Number of family members	4.32	4.28 (4.21, 4.36)

CI: Confidence interval.

4.2.2 Annual violent death rates by province and household characteristics

Table 16 lists the death and injury rates for each province within South Africa. The Western Cape had the highest monthly injury rate, followed by the Northern Cape, then the Northern Province. KwaZulu Natal had the lowest injury rate of 57/100,000. Gauteng had the highest annual death rate, followed by the Eastern Cape. The Free State had the lowest annual death rate.

Table 16: Descriptive overview of rates of violence in South Africa, by Province

Province	**Annual rate of violent deaths** (per 10,000 households)	**Monthly rate of violent injury** (per 100,000 people)
Western Cape	63	378
Eastern Cape	104	204
Northern Cape	85	285
Free State	39	127
Kwazulu Natal	87	57
North West	91	70
Gauteng	144	112
Mpumalanga	47	160
Northern	40	221
All of South Africa	89	158

Annual violent death rates (per 10,000 households) by household characteristic are provided in Table 17. P-values from the Pearson chi-square statistic are listed to indicate a significant difference between the rates. Households that were most likely to experience a death due to violence were those in informal urban areas, in the 4th quintile of the asset index (the second wealthiest group), had eight or more family members, those headed by a female or were Black/African.

Table 17: Death rate/10,000 households and percentage of households experiencing a death in the past year, by household characteristics

Variable	Annual violent death rate (per 10,000 households)	p-value
Asset index		<0.001
Quintile 1	97	
Quintile 2	97	
Quintile 3	55	
Quintile 4	166	
Quintile 5	21	
Sex of head		0.010
Male	67	
Female	120	
Race (N= 10,320)		0.004
Black/African	104	
Coloured	42	
White	-	
Asian/Indian	29	
Education of head		0.046
Primary level or less	110	
Secondary level or more	66	
Employment of head		<0.001
Employed	43	
Unemployed	119	
EA type		0.218
Urban formal	86	
Urban informal	164	
Commercial farm	17	
Tribal area	93	
Other non-urban area	0	
Family size		<0.001
1-7 members	77	
8+ members	196	

P-value from Pearson's chi-square test of homogeneity

4.2.3 Bivariate associations between household level risk factors and violent death

Table 18 presents the results of bivariate analyses between household level risk factors and the occurrence of a death due to violence in that household in the past year. Households that were the most at risk of experiencing a violent death were those that were headed by a female (OR= 1.81; 95% CI: 1.14, 2.87), and those in urban informal areas (compared to households in formal urban areas, OR= 1.92; 95% CI: 1.04, 3.56). As the age of the household head increased by one year, the risk of death due to violence taking place increased by 2% (1%, 3%).

Protective factors that were significant at the 95% confidence level included living in the third or fifth quintile of the asset index (OR= 0.47; 95% CI: 0.23, 0.97; OR= 0.18; 95% CI: 0.06, 0.57 respectively), employment of the household head (OR= 0.36; 95% CI: 0.20, 0.63) and living in a commercial farming area (OR= 0.95; 95% CI: 0.91, 0.99). Coloured households and White/Asian households had significantly reduced risks of a member dying from violent causes when compared to Black/African households. The odds ratio's (95% Confidence Interval) were 0.40 (0.16, 0.97) and 0.07 (0.01, 0.48), respectively. The protective effect of the educational attainment of the household head was small, but significant at the 5% significance level. A one-year increase in education reflected a 5% (1%, 9%) reduced risk of a death due to violence occurring in the household.

When the experience of violent injury was combined with a violent death in the analysis, the sample size increased by 55%. The results remained consistent with the exception of the third

quintile of the asset index which was no longer a significant protective factor. On the whole, point estimates became more precise.

Family size was included in the analysis primarily to control for confounding, as larger households may be more likely to experience a death due to violence than smaller households simply due to their size. Large families were more at risk factor for violent death than smaller families; as family size increased by one member, the risk of a member dying due to violence increased by 10% (95% CI: 2%, 18%).

Table 18: Bivariate analyses of household characteristics and the occurrence of a violent death or injury in the previous year/month

Variable	Violent death (N= 103)			Violent death or injury (N= 187)		
	OR	95% CI	p-value	OR	95% CI	p-value
Female headed household	1.81	1.14, 2.87	0.011	1.55	1.09, 2.20	0.014
Age of head	1.02	1.01, 1.03	0.006	1.01	1.002, 1.02	0.025
Coloured head*	0.40	0.16, 0.97	0.043	0.88	0.53, 1.46	0.616
White/Asian head	0.07	0.01, 0.48	0.007	0.23	0.09, 0.56	0.001
Asset index**						
2nd quintile of index	0.99	0.53, 1.86	0.987	0.89	0.52, 1.55	0.688
3rd quintile of index	0.57	0.27, 1.19	0.135	0.71	0.41, 1.24	0.234
4th quintile of index	1.72	0.93, 3.18	0.086	1.24	0.73, 2.10	0.423
5th quintile of index	0.22	0.07, 0.70	0.011	0.36	0.18, 0.72	0.004
Employed head	0.36	0.20, 0.63	<0.001	0.49	0.34, 0.73	<0.001
Education of head	0.95	0.91, 0.99	0.011	0.96	0.93, 0.99	0.019
Enumerator Area type***						
Urban informal	1.92	1.04, 3.56	0.037	2.07	1.28, 3.36	0.003
Commercial farms	0.20	0.05, 0.84	0.029	0.29	0.12, 0.69	0.005
Tribal/other rural areas	0.98	0.60, 1.61	0.957	1.05	0.72, 1.54	0.801
Family size	1.10	1.02, 1.18	0.015	1.05	1.03, 1.07	<0.001

OR: Odds ratio; CI: Confidence interval; P-value from Pearson's chi-square test of homogeneity
* Black/African households are the reference category
** The poorest quintile (Quintile 1) is used as the reference category. P-values were calculated based on the relationship between the quintile to quintile 1, without taking the other three quintiles into account.
*** Formal urban areas are the reference category

4.2.4 Multivariate associations between violent death and household level risk factors

Tables 19 and 20 present the separate effects of the asset index and employment of the head of household on the occurrence of a violent death in the household in the past year. Crude odds ratios and 95% confidence intervals are provided, followed by Model 1 which controlled for household head demographics (age, sex, and race), and Model 2 which additionally controlled for the remaining socioeconomic variables (education of the household head and either asset index or employment of the household head, as necessary).

Once controlling for demographic variables of the head of the household, no quintiles of the asset index were significantly correlated with the experience of a violent death (Table 19 Model 1). Similar to the crude association an inverse dose-response (a reduced risk of a violent death as wealth increased) was apparent, with the exception of the fourth quintile, which was a risk factor for violence when compared to the poorest households. In this model age of the head of household was a risk factor for the outcome: as age increased by one year, the likelihood of a violent death having occurred increased by 2% (0.2%, 3.3%). Point estimates showed that male-headed, Coloured, or White households were less likely to have experienced a violent death than female-headed or Black/African households, respectively, although these estimates were not significant at the 5% level. When the socioeconomic variables were added to the model (Model 2), the dose-response effect of the asset index diminished further and no significant associations were observed.

While the crude effect of household head employment was protective against the experience of a violent death, this effect was diminished once demographic characteristics and other measures of socioeconomic position were controlled for (Table 20 Models 1 and 2).

Table 19: Multivariate analysis of the effect of household asset index on a death due to violence in the household in the past year

Model variables	Crude OR (95% CI) N= 12,017	Model 1 OR (95% CI) N= 10,113	Model 2 OR (95% CI) N= 9,833
Asset index			
1st quintile of index	1	1	1
2nd quintile of index	0.99 (0.53, 1.86)	0.98 (0.50, 1.93)	1.00 (0.50, 2.00)
3rd quintile of index	0.57 (0.27, 1.19)	0.59 (0.26, 1.35)	0.57 (0.24, 1.35)
4th quintile of index	1.72 (0.93, 3.18)	2.03 (1.04, 3.95)	2.03 (0.98, 4.21)
5th quintile of index	0.22 (0.07, 0.70)	0.48 (0.09, 2.45)	0.57 (0.09, 3.55)
Age of head		1.02 (1.002, 1.033)	1.01 (0.99, 1.03)
Male head		0.61 (0.35, 1.06)	0.63 (0.36, 1.13)
Coloured household*		0.49 (0.19, 1.25)	0.54 (0.21, 1.40)
White/Asian household		0.15 (0.01, 1.72)	0.16 (0.01, 1.85)
Education of head			1.01 (0.95, 1.08)
Employed head			0.51 (0.25, 1.04)

OR: Odds ratio; CI: Confidence interval
* Black/African is the reference category

Table 20: Multivariate analysis of the effect of household head employment on the experience of a violent death within the household

Model variables	Crude OR (95% CI) N= 12,030	Model 1 OR (95% CI) N= 10,129	Model 2 OR (95% CI) N= 9,833
Employed head	0.36 (0.20, 0.63)	0.50 (0.25, 1.00)	0.51 (0.25, 1.04)
Age of head		1.01 (0.996, 1.03)	1.01 (0.99, 1.03)
Male head		0.66 (0.34, 1.16)	0.63 (0.36, 1.13)
Coloured household*		0.53 (0.21, 1.33)	0.54 (0.21, 1.40)
White/Asian household		0.10 (0.01, 0.78)	0.16 (0.01, 1.85)
Education of head			1.01 (0.95, 1.08)
Asset index**			
2nd quintile of index			1.00 (0.50, 2.00)
3rd quintile of index			0.57 (0.24, 1.35)
4th quintile of index			2.03 (0.98, 4.21)
5th quintile of index			0.57 (0.09, 3.55)

OR: Odds ratio; CI: Confidence interval
* Black/African is the reference category
** 1st quintile (the poorest group) is the reference category

5.0 DISCUSSION

The effect of socioeconomic position on health has been researched in a variety of settings, and is increasingly being analysed with respect to violence. Examining the relationship between socioeconomic position and violence in the South African context has demonstrated that the relationship may be different in this setting than in more developed countries. This research sheds light on the importance of conducting country-specific research (which in this case includes identifying appropriate measures of socioeconomic position and accounting for area-specific confounding variables), rather than accepting relationships to be true without further investigation because they have been found to be true in other settings.

This analysis illustrated that different measures of socioeconomic position produce differing results that are dependent on the level at which the analysis is conducted, individual or household, and correspondingly, how violence is operationalised (as an injury or death). At the individual level, education and employment were risk factors for violent injury, whereas household wealth (as measured by the asset index) showed a slight inverse dose-response between decreasing violent injury and increasing wealth. At the household level, all three variables were protective factors against the household experiencing a violent death in the past year. Based on the bivariate analysis, it seems that household deaths due to violence have greater negative correlation with increasing socioeconomic position than violent injuries at the individual level. These individual level findings are not consistent with research conducted in more developed countries (where employment and education are commonly

protective against violence) and therefore they require further investigation to draw out the pathways between employment and education and the individual experience of violence.

Individual level risk factors significantly associated with reporting a violent injury in the past month included: being male, between the ages of 30-39 years, employment, engaging in risky drinking behaviour, increasing education, and living in an urban informal settlement. No association was found between the experience of violence and race of the individual, sex of the head of household or household wealth at this level. In the multivariate analysis, the effect of employment on violence diminished when other measures of socioeconomic position were controlled for, yet the protective effect of living in the wealthiest quintile remained. Violence that was experienced outside of the home was positively correlated with individual characteristics (such as being male, employment, having higher levels of education or engaging in risky drinking) whereas violence experienced inside the home only showed significant inverse associations with characteristics of the household (such as employment of the head of the household, living in the wealthiest quintile, or increasing family size). At the household level, households most likely to experience a violent death were those that were in urban informal settlements, had eight or more family members, were Black/African, or headed by a female. A dose-response between increasing wealth and reduced likelihood of experiencing a violent death was not found, as households in the fourth quintile (the second wealthiest) had the highest violent death rate.

5.1 Socioeconomic position and individual level violent outcomes

5.1.1 Employment

Previous research has indicated that lack of material or financial resources may be a precursor to violence at the individual level due to increased levels of frustration (Messner, 1983; Arthur, 1991). In this study, when employment (operationalised as recent work that resulted in monetary compensation) was used as a proxy for access to resources (and therefore one's socioeconomic position in society), this finding was not confirmed. In fact, these data showed that employment was significantly associated with increased levels of violence, particularly with respect to violence that occurred outside the home.

A possible explanation for this finding is that alcohol use confounded the relationship between employment and violence. Respondents who were current or previous abusers of alcohol were more likely to have worked for payment in the past week and were also much more likely to have experienced a violent injury in the past month. The positive correlation between employment and alcohol use in rural farming areas of South Africa could be explained in part by the DOP system, where farm workers are paid in part for their labour with alcohol (generally wine). In his research on with this farming population in rural areas of the country, London found that 19.4% of workers were currently using the DOP system (2000). However, this explanation is applicable to only a small portion of the national population (primarily around the Western Cape Province). Alternatively, employment and a cash income may lead to the ability to purchase and use alcohol excessively, resulting in increased levels of violence. The effect of alcohol on the relationship between employment and violence is demonstrated in Table 13 Model 3. When alcohol abuse is added to the model,

the effect of employment diminishes (OR= 1.40; 95% CI: 0.71, 2.74) and the point estimate of alcohol remains high (OR= 2.29; 95% CI: 0.98, 5.37). There is a significant decrease in the sample size when alcohol is added (N= 13,172) which may account for the insignificant association between alcohol abuse and violence.

5.1.2 Education

Similar to employment, there was a positive correlation between increasing education and the experience of violence at the individual level. When demographic characteristics and other measures of socioeconomic position were added to the model (Table 13 Model 2), education was no longer a significant risk factor for violence. This could be an indication that employment mediated the relationship between education and violence.

SADHS data suggest that educational attainment is significantly associated with race ($p<0.001$) in South Africa, thus demonstrating the degree to which access to education was dictated by racial classification during apartheid. Specifically, the data show that in 1998 Whites had the highest average level of education (9.5 years), followed by Asians/Indians (7.9 years), Coloureds (6.1 years), then Blacks (5.1 years). For the next few decades, educational attainment of the population will still be reflective of past apartheid policies. However, with the recent introduction of Black Economic Empowerment policies, Black Africans may increasingly attain higher levels of socioeconomic position within their communities regardless of their education level. For this reason, employment or asset ownership may be better measures of socioeconomic position, particularly for older South Africans.

5.1.3 Household wealth

At the individual level, crude associations between the different quintiles of household wealth and the experience of a violent injury were not significant. When demographic characteristics and other measures of socioeconomic position were adjusted for, the effect of the asset index displayed a small dose-response- as wealth increased in the household, the risk of experiencing a violent injury decreased (Table 12 Model 2). The trend continued in Model 3, which included the addition of alcohol abuse in the model. However, for either model, only the fifth quintile of the asset index was significantly protective against violence when compared to the first quintile.

Because 230 households had missing data on some items that comprise the asset index, the measure for household wealth was not available for every household, thus approximately 1,000 individuals were not included in the bivariate analysis (two had experienced a violent injury). The sample size continued to decrease with the inclusion of variables (Table 12) and therefore the results are difficult to interpret. For example, the second, third, fourth, and fifth quintiles only begin to be protective against violence when compared to the poorest group in Model 2, which had a sample size of 33,367. This model added education and employment to the previous model, which may have resulted in a change in the point estimates for the quintiles in the asset index. The point estimates continue to become more protective and their confidence intervals more narrow as variables are added to the model and the sample size gets smaller. This could be the result of a true relationship between household wealth and the experience of violence that is not explained by confounding variables. However, it

indeterminable whether these changes would have been significant had the sample size been the same as for Model 1 (N= 46,129).

5.1.4 The role of race and alcohol use in determining individual experience of violence

With respect to race, it is important to note the larger proportion of the population who experienced violence in the past month that was Coloured (16.4%), compared to the population that did not experience violence (10%). This difference was not significant at the 5% level of significance (p= 0.068), but the risk associated with this race group remained when household wealth, age and sex were controlled for (OR: 1.95; 95% CI: 1.00, 3.82). When education and employment were added to the model (Table 12 Model 2), being Coloured remained a risk factor (OR: 1.94; 95% CI: 0.95, 3.96). The statistical non-significance could be due to the reduction in the sample size by 13,000 people that occurred when employment was added and all people under the age of ten were not included. Model 3 (Table 12) suggests that the reason the Coloured population may be more at risk for experiencing violence is due to the correlation between race and alcohol abuse. When alcohol use is controlled for the sample size decreases substantially, as mentioned earlier, but the effect that being male and being Coloured had on determining violence was altered more than any other variable. Specifically, Coloured people had nearly twice the risk of Blacks of experiencing violence when alcohol use was not controlled for, versus a reduced risk of 21% when alcohol was included in the regression. Previous research has demonstrated the association between alcoholism and the Coloured population in South Africa (London, 2000), and this in turn could be reason why this population is more at risk for violence as well. Based

on SADHS data, over a quarter of the Coloured population aged 15 years and older was considered to be 'at-risk' drinkers according to the CAGE questionnaire.

It has been demonstrated that the CAGE instrument is most effective when used as part of a general health history and should not be preceded by questions regarding how much or how frequently the individual drinks (Ewing, 1974). Because the CAGE questions are preceded by questions asking about the number of drinks consumed during the week and during the weekend in the SADHS (questions 88 and 89 of the Adult Health Questionnaire, respectively), respondent bias is possible if the person felt defensive about alcohol use. This bias would result in an under-representation of the true proportion of the sample population with risky drinking behaviour. However, the Medical Research Council in Cape Town felt that the use of the CAGE instrument as a measure of alcohol abuse is not applicable in South Africa as it overestimates the number of dependent drinkers in the country (Rosana Norman, personal communication). This feeling is supported in London's research where the CAGE measure estimated that 87% of the research population as alcohol dependent whereas a shortened version of the Michigan Alcoholism Screening Test (MAST) questionnaire estimated 65% of the same population as alcohol dependent. While CAGE may overestimate levels of alcohol dependency in South Africa, the effect of alcohol on violence cannot be denied. Previous research conducted in Cape Town has found that 28% of trauma patients had problems with alcohol dependency (Goosen et al., 2003). Associations between alcohol and violent victimisation (Bowley et al., 2004, Fisher and Charlton, 2001; van der Spuy, 1993) as well as between alcohol use and violent perpetration (Allan et al., 2001) have also been found in South Africa.

Aside from problems with measurement error, the measure used for alcohol use could have been conceptually impractical with respect to violent outcomes. Respondents answered questions around alcohol use whether they were previous or current drinkers. Previous drinking behaviour may not have influenced an individual's experience with violence, yet it is indeterminable when 'previous' drinking patterns ended. For example, alcohol abuse taking place years ago is probably not correlated with the individual's experience with violence a few weeks ago. This is particularly important since violent injuries within the past month are the outcome of interest. If an individual is classified as one who abuses alcohol due to a history of alcohol abuse (but no longer drinks) and did not experience violence, the effect that alcohol has on the outcome would be reduced.

5.2 Socioeconomic position and household level violent outcomes

5.2.1 Employment of the head of household

In an unadjusted analysis, employment of the head of the household was protective against the experience of a violent death in the household over the past year (OR= 0.36; 95% CI: 0.20, 0.63). The association did not remain significant when demographic characteristics of the household or other measures of socioeconomic position were added to the model (OR= 0.50; 95% CI: 0.25, 1.00; OR= 0.51; 95% CI: 0.25, 1.04, respectively). Insignificant point estimates could be real, or due to the continual decrease in sample size as variables were added. The bivariate association between employment of the household head and violent death included 12,030 households, while Model 1 included 10,129 households and Model 2 only 9,833 households.

5.2.2 *Education of the head of household*

Unlike the individual level, education of the head of the household was a significant protective factor against the likelihood of a household experiencing a death due to violence. However, this reduced risk was not significant after controlling for demographic characteristics and other measures of socioeconomic position (Table 19 Model 3). The effect of employment on the association between education and violence was similar to that at the individual level and it suggests that employment is a mediating variable in this instance as well.

5.2.3 *Household wealth*

In unadjusted analyses, the annual violent death rate decreased as household wealth increased; with the exception of quintile 4 (see Table 17). The Medical Research Council in Cape Town confirmed this inconsistency with the asset index; a clean dose-response between the index and other health issues researched using the 1998 SADHS dataset has not been found previously (Rosana Norman, personal communication).

American sociologist William Julius Wilson has argued that socioeconomic position is in the causal pathway between race (and with it, racial discrimination) and crime and violence (1987). This is consistent with research in South Africa that has illustrated a link between violent victimisation, race, and social depravation (Masuku, 2002). In the bivariate analysis, Coloured, White and Asian households are significantly less likely than Black households to experience a death due to violence in the past year. Table 20 Model 1 (modelling the effects of employment and demographic characteristics on household death due to violence) suggests

that White/Asian households are at a reduced risk of experiencing a violent death compared to Black families. This protective association is not found when household wealth is controlled for instead of employment (Table 19 Model 1), indicating that the effects of race and household wealth may be more interrelated than race and employment. When household wealth is added to the model with employment and demographics of the household head, the effect of race is diminished (Table 20 Model 2).

In South Africa, race and socioeconomic position are strongly linked to residential area due to the Group Areas Act that forced Black Africans to live in designated areas that provide inadequate living conditions. Households in informal urban areas (that are characterised by overcrowding, lack of infrastructure and public facilities, poor lighting and unsanitary conditions), were nearly twice as likely to have a death due to violence as households in formal urban areas (OR= 1.92; 95% CI: 1.04, 3.56). This association has been found previously (Schonteich and Louw, 2001; Masuku, 2002).

5.3 Discrepancies between household and individual level results

Employment and education at the individual level are risk factors for violence, yet when measuring these variables at the household level via the household head they are protective against violence. Analyses at the individual and household levels could have produced differing results for a variety of reasons. First, it is important to consider the difference in the outcomes for each level of analysis. At the individual level, violent injury that occurred within the previous month is the outcome of interest while at the household level violent death that occurred in the previous year is the outcome. It could be plausible that the difference in risk

factors is due to the difference in assessing morbidity versus mortality. Self-inflicted injuries were excluded from the dependent variable for the individual level analysis due to the different risk factors that may be associated with this category of violence; however, deaths due to violence included both suicide as well as interpersonal violence. For this reason, there may be inconsistency in the effects of similar measures of socioeconomic position for the two outcomes. Inconsistency could also be due to measurement bias between the two different outcomes. Information on both outcomes was gathered by the individual who answered the household questionnaire. While it is doubtful that a death due to violence in the past year would be forgotten, the respondent may not know of (or remember) a violent injury of a household member within the past month, therefore bias may have been introduced in this latter situation.

Secondly, it is important to consider the differences in the measures of socioeconomic position for each level of analysis. Employment and education of the head of household provide an indication of the wealth of the household, not the status of the individual who died due to violence. Deaths (in general) could be more associated with lower income households than injuries due to lack of access to health services or poor emergency response. This may explain why the trend associated with the asset index was more defined in the household level analysis, and why employment and education were protective rather than risk factors for the outcome. At the individual level, alcohol use was significantly associated with household wealth; people who were in the first quintile of the asset index were more likely to be at-risk drinkers than people in the fifth quintile of the asset index. This relationship showed a dose-response with increasing household wealth. Since there were no data collected on the

individuals who had died in the past year, it could be extrapolated from the individual level analysis that those in the poorer quintiles of the asset index may have been more likely to have abused alcohol than those in the wealthier quintiles. Use of alcohol could have confounded the relationship between the asset index and violent death and explain why the asset index was a more significant risk factor for violence at the household level.

5.4 Limitations of the research

5.4.1 Study design

While cross-sectional studies are frequently used for descriptive epidemiology, results must be interpreted with care when using this study design for analytic analysis. Two of the more significant drawbacks of cross-sectional studies are the inability to establish temporality in many instances and the likelihood of over-sampling prevalent cases of long duration. This study did not suffer from the latter drawback, as the outcome was measured over the past month, and injuries of varying severity (as long as they warranted medical attention) were included in this measure. The way in which cross-sectional studies gather information on both exposure and outcome at the same point in time inevitably produces problems establishing temporality. When temporality cannot be determined, causal associations between socioeconomic position and other risk factors and violence cannot be established.

Establishing temporality is a particular problem with respect to the relationship between employment and the experience of violence at the individual level. The independent variable gathers information on the past week and the dependent variable gathers information on the previous month. If an individual did not work in the past seven days, it could be due to an

injury that was the result of violence that had occurred sometime in the past month thus diluting the measure of effect between employment and violence. In the case of risk factors such as race, sex, age, and even education, temporality can be established since these characteristics are genetic or take place before the onset of an injury that occurred within the last month. It could be argued that temporality could be established in the relationship between the asset index and the experience of a violent injury. Because wealth was measured by housing structure, ownership of material possessions and sanitation it could be possible that a death in the past year/injury in the past month may not have altered the household level of wealth even if the incident was experienced by the families breadwinner. SADHS data indicate that residential mobility rates are lower among the less well-off population, which is also the group that is more likely to experience violence. This could indicate that a death due to violence in the last year did not precede the conditions of the housing structure or access to public resources (such as drinking water or sanitation) all of which are elements of the asset index.

5.4.2 Small sample size

With only 88 injuries in the individual sample and 103 deaths in the household sample, statistical efficiency was compromised; particularly when multivariate regression analysis was conducted. The model building process resulted with many insignificant risk factors in the model, which could in part be due to the small sample size. As the sample size decreases, the likelihood that produced results are due to chance increases, therefore point estimates that indicate a variable as either a protective or risk factor for violence must be interpreted with care.

The small number of people experiencing a violent injury required combining violence that occurred inside with violence that occurred outside of the home. This could lead to a diluted effect of some risk factors, as risk factors are different between the two phenomena (see Table 11). Similarly, the small number of people experiencing violence led to the grouping of child and adult victims which could have different risk factors associated with them. For example, employment may be a significant risk factor for violence in adults, but employment status of the parents may be a more appropriate measure of socioeconomic position for children. Nearly 15% of reported incidences of violence involved people under the age of 15 years.

The small number of injuries and deaths due to violence also led to the inability to observe the effect of interaction between variables. For example, the interaction between wealth of the household and the employment of the head of the household may be significant in estimating risk of violent death in the household.

5.4.3 Information bias

Information bias may have been presented in the analysis through employment and race classifications and resulted in nondifferential misclassification of these variables. Employment was based on work for payment in the previous seven days, which may not have been an adequate proxy for 'employed' or 'unemployed'. An individual or head of household may have recently lost his/her job and therefore was classified as unemployed but may have been employed when injured due to violence. This misclassification is even more likely in the household level analysis. If the head of household did not work in the past week, they were

classified as unemployed although the experience of a violent death in the household was measured for the previous year.

The assumption that individuals lived in racially homogenous households may have resulted in the nondifferential misclassification of race was possible for nearly 27,000 of the 47,091 individuals for whom race data was analysed. However, since race data was collected on all adults in the households that were selected for the adult survey and on all adult females in every household, there were usually multiple people in each household that had race information recorded. The degree of misclassification was reduced because the application of race classification to remaining members was not conducted if races conflicted. The small number of people experiencing violent injuries and the importance of race in South African research made the assignment of race necessary to maintain statistical efficiency and get as accurate a depiction of this relationship as possible.

The assignment of each household to a combined asset score based on the variables included in the asset index could have also led to error in measurement of socioeconomic position based on household wealth. For example, questions in the SADHS inquiring about car ownership, television ownership, or wall material do not provide information regarding the quality, quantity or age of these items, leaving a lot of room for discrepancy.

Nondifferential misclassification generally dilutes the association between the two variables. This occurs because categories are grouped together- as employed/unemployed, different racial categories, or based on yes/no or categorical responses to questions on the SADHS

regarding asset ownership or building materials. When it is anticipated that the outcome is dependent on the assignment of one of these categories the nondifferential misclassification of individuals to these categories results in a smaller effect size than would otherwise be observed. This misclassification could account for the insignificant results obtained predominantly in the multivariate regression models at both the individual and household levels.

5.4.4 Error in measuring socioeconomic position

Error in measurement of socioeconomic position is feasible due to the complexity of economic and social factors that determine an individual's position in society. While the measures used in this research were similar to those frequently used in the field of social epidemiology (Lynch and Kaplan, 2000), it cannot be ensured that they are accurate estimates. In fact, research in the United States has shown that single measures of income or education as a predictor for health outcomes grossly underestimates the extent to which socioeconomic position plays a role in determining the health inequalities between the African-American and white populations (Krieger et al., 1993; Krieger, 1994). The complexity of racial inequalities in South Africa could further exacerbate the problems associated with relying on a single measure of socioeconomic position as a predictor of violence even when other social or economic measures are controlled for. It has been shown that experiences accumulated over the life course can have substantial impact on health outcomes, particularly with respect to the cumulative effects socioeconomic position (Lynch and Kaplan, 2000); therefore it is important to consider that data for each measure of socioeconomic position were collected at one point in time for each individual or household.

The use of a socioeconomic variable in a cross-sectional study such as this may result in an underestimation of the effect of socioeconomic position on health outcomes.

The effect of measurement error on the results is likely to be non-differential, therefore the effect size between socioeconomic position (as measured by the asset index, employment, or education) and the experience of violence would most likely be diluted.

5.4.5 Age of the data

The data used for this research was conducted in 1998 and made available in 2001. The social and economic landscape in South Africa has continually progressed since democracy and it will be important to assess these changes and the effect that socioeconomic position has on violence using the 2003 South African Demographic and Health Survey. Of particular interest may be the relationship between race, socioeconomic position and violence as state-level efforts have focused on previously disadvantaged populations. Results of the 2003 SADHS are not yet available.

5.4.6 Variables that were missing from the analysis

Owing to the fragility of the data, variables included in multivariate analyses were kept to a minimum. For this reason, the number of people in the household was not controlled for in multivariate regressions at the household level and this may have had an impact on the likelihood of experiencing a violent death in the past year.

5.5 Strengths of the research

5.5.1 Filling a research gap

The aim of this research was to fill the gap of quantitative national-level violence research in South Africa. This research provided an overview of the epidemiology of violence in South Africa that enables researchers working on small-area studies or studies that address particular types of violence (for example, youth violence or violence against women) to compare results to those at the national level or an earlier time period. The SADHS is currently the only nationally representative database that collects information on the experience of violence in such a way that area of residence of the victim is maintained and information on a variety of risk factors is collected. While the National Injury Mortality Surveillance System (NIMSS) collects data on deaths due to violence using registries it is overrepresented in urban areas and victim residence or socioeconomic position cannot be determined due to the nature of data collection and information gathered. It is also important to note that while deaths due to violence were analysed, this research also assessed the risk factors for non-fatal outcomes that are due to violence, an outcome that is much less researched in South Africa (Bradshaw et al., 2003).

5.5.2 Provision of both relative and absolute measures of association between socioeconomic position and violence

In social epidemiology, the most common approach to expounding the socioeconomic differences in health is to compare extreme socioeconomic categories and express the result in a rate ratio (Lynch and Kaplan, 2000). Because of the binary nature of the dependent variable and the consequent need to use logistic regression in this analysis, odds ratios are provided

rather than rate ratios which may result in the inflation of the actual effect size between measures of socioeconomic position and violence. A problem associated with comparing the effects of only the extreme categories of socioeconomic position on health is that the rest of the population is left out of the analysis (for example results are presented as comparisons between higher education and no education or between the poorest population and the wealthiest population). In this study, analysis was conducted in such a way that relative associations were examined at not only the extreme values of socioeconomic position, but for each group in the population (based on the quintiles of the asset index). Secondly, education was used as a continuous variable in the analysis so that data was not lost in the process of categorisation. This means that results can be interpreted for the whole population and the effect of increasing education (by year) is shown with respect to the likelihood of experiences a violent injury or death. A further drawback to the use of relative measures to determine the public health impact of differences in socioeconomic position is that the absolute impact of the gradients is not identified (Lynch and Kaplan, 2000). In this analysis the asset index is divided into quintiles and injury and death rates for each quintile (Tables 10 and 17 respectively) provide an absolute level of risk associated with each wealth category. From a public health perspective, the absolute risk associated with different levels of socioeconomic position is more effective than relative measures such as rate and odds ratios, particularly when comparing changes in socioeconomic inequalities over time and among different populations (Mackenbach and Kunst, 1997).

5.5.3 Potential biases assessed

Because the respondent of the household questionnaire provided information on violent injuries for the entire household, data were analysed to assess for a difference in the self-reporting of violence versus the reporting of violence experienced by others in the household. Being a respondent was not associated with reporting violence in general (OR= 1.33; 95% CI: 0.80, 2.21), although was significantly associated with the report of violence inside the home (OR= 2.98, 95% CI: 1.47, 6.01). There are a variety of explanations for this finding. These include a larger proportion of female household questionnaire respondents and women were more likely to experience violence in the home (although not significantly so), there may be willingness to discuss such personal incidences only if occurring to one's self, or there could be a lack of knowledge about abuse that occurs within the home between other members of the family. These explanations are also supported by the finding that family size is protective against violence occurring inside the home (OR= 0.74; 95% CI: 0.62, 0.89), but is not associated with violence occurring outside the home (OR= 0.98; 95% CI: 0.87, 1.12). Larger families result in the reliance of violence data for a larger number of people on the individual who answers the questionnaire, and as mentioned these people may not be aware of violence occurring, or may not feel comfortable discussing violence within the household unless it had happened to them. Alternatively, this result may not be due to responder bias, but rather a true effect of larger families; as the household size increases, violence decreases due to the shame or social stigma associated with domestic abuse.

5.6 Unanswered questions and future research

5.6.1 Analysis of mediating variables

Some epidemiological research identifying and analysing potential mediating factors between poverty and violence in South Africa has begun to take place at the community level (Ahmed et al., 2004). Particularly as employment and education were identified as risk factors for violence at the individual level in this analysis (which juxtaposes results that have been found in other settings), potential mediating variables need to be identified and further explored so this relationship is better understood.

5.6.2 Analysis of the effect of income inequality on violence

The relationship between income inequality and health has been studied in various contexts throughout the world and focuses on the effect of relative income or wealth rather than absolute measures of income on health outcomes. Income inequality and violence began with the work on social disorganisation theory and juvenile delinquency in urban areas by Shaw and McKay in 1942 and continued with the work by Blau and Blau in 1982 on economic inequality and violent crime, and Sampson, Raudenbush and Earl on income inequality, collective efficacy, and violent crime in 1997. Collectively, these studies have guided much of the work in this field.

In a review of international literature addressing the relationship between income inequality and health (including violence), Wagstaff and van Doorslaer (2000) identified the Income Inequality Hypothesis (IIH) as a hypothesis (although not always explicitly termed as such) frequently used to explain how income affects health. The IIH focuses on the contextual effect

of income inequality at the group level on individual level health, and stresses the psychological and social impact income inequality has on individuals due to the comparative processes it inevitably produces. In the United States, multilevel research has shown that in some settings state level income inequality is significantly associated with homicide and violent crime (Krahn, et al., 1986; Sampson et al., 1997) and is a stronger predictor of homicide and violent crime than absolute poverty (Kennedy et al., 1998). Kennedy and colleagues (1996) found that homicide was the cause of death most strongly associated with income inequality in the United States and demonstrated that the combined effects of income inequality and poverty accounted for over half of the variation in homicide rates between the 50 states in 1996. In Japan, the income gap has been narrowing significantly since the 1970s and the country has not experienced the rise in crime other developed countries have (rates are actually declining in urban cities) (Wilkinson, 1994). The IIH has been taken a step further in violence research (as well as in other fields) by addressing the specific mediating factors that link income inequality to increased rates of violence in a population. For example, Sampson et al. (1997) found that collective efficacy (defined by the researchers as the combination of social cohesion and the willingness to act for the collective benefit of the neighbourhood) mediated the relationship. Since, others have shown various measures of social cohesion and social capital to link income inequality with violence (Kennedy et al., 1998; Kawachi et al., 1999).

While many studies have examined the relationship between income inequality and health/violence, there are very few studies conducted in developing countries (Kaplan, 2004; Waters et al., 2004), making it difficult to determine the applicability of this association to the

developing country context. Much of the research conducted outside of the United States has failed to show an association between income inequality and health/violence (Jones et al., 2004; Blakely et al., 2003; Gerdtham and Johannesson, 2001 in Subramanian and Kawachi, 2004; Shibuya et al., 2002; Osler et al., 2002). This could be due to their more egalitarian political system (such as in Japan, Sweden, and Denmark) and therefore a lesser gradient of inequality, or due to studies confining their analysis to smaller geographic scales (to areas within a single city versus multiple cities within a province or state for example). It has been suggested that further research examining the association between income inequality and health outcomes is needed in societies that are as unequal, or more unequal, than the United States (Subramanian and Kawachi, 2004). This recommends South Africa as a society in which to study this association.

The 2003 South African Human Development Report (SAHDR) concluded that inequality in both income and wealth has increased in recent years. Using the Gini coefficient as an indicator (the Gini coefficient is based on a scale of 0-1 where 1 equals total inequality), rates have increased from .60 in 1995 to .63 in 2001, making South Africa one of the most inequitable societies in the world (SADHR, 2003). For comparison, the Gini coefficient in Brazil (1989) was .596, Zimbabwe (1990) .568, Zambia (1996) .524, Sweden (1992) .324, and the United States (1991) .379. These statistics came from the high-quality database of Deininger and Squire (1996) used and updated by the World Bank. This database accepted the Gini coefficient of South Africa (1993) to be .623 (World Bank, 2004). In South Africa, levels of inequality have increased across all provinces, sexes and races, and have clustered disproportionately in particular geographic areas and races (SAHDR, 2003).

5.6.3 Methodological next steps: multilevel analysis

Research in this area would greatly benefit from the aggregation of socioeconomic measures (such as employment rates, percentage of the population who is not formally educated, or the percentage of the population living in poverty) to the group level (be it a 'community' as defined by the census tracts, or a district). Using group level data, researchers could explore the ways in which individual level outcomes are affected by processes and contexts at the larger geographic level. Diez-Roux (1998) summarises the types of studies conducted in the social sciences in the following manner:

Independent Variable	Dependent Variable	Type of Study
Group level	Group level	Ecological
Individual level	Individual level	Individual level
Group and individual level	Individual level	Multilevel or contextual

As shown, a multilevel analysis uses individual *and* group level data to determine outcomes at the individual level. This form of analysis is needed to determine if the relationship between group level variables and violence is contextual or compositional. If contextual, the association found is due (at least in part) to group level characteristics. The results ask the question: What is happening socially or economically in these areas to make them more violent? For example, contextual associations between income inequality and violence could stem from the breakdown in social norms or social cohesion and trust that result from inequitable living areas. Further studies would then be required to begin to identify possible pathways that explain the relationship. The association is found to be compositional if the

association between income inequality and violence occurs when the only variables included in the analysis are group level. When individual level risk factors are accounted for (such as income, employment, and education) and the association disappears, it can be concluded that income inequality was only found to be a risk factor for violence because of the natural grouping of low income people in inequitable areas.

The ecological model (which considers societal, community and household level factors) has long been used for understanding the determinants of violence (Krug et al., 2002). However, without considering individual factors, ecological studies cannot determine the contextual effect of community level factors on the relationship. With respect to income inequality and violence, the association could be the result of compositional effects of income inequality (the aggregation of large numbers of poor people in an area). The true risk factor for violence may be poverty (at an individual level) rather than income inequality (at the group level). Results from ecological studies may also fall prey to the ecological fallacy. This fallacy occurs when associations found at the group level fail to be found at the individual level.

Conversely, when analyses are based only on data collected at the individual level, characteristics of social groups that may have a significant impact on an individual's behaviour are neglected in the analysis. It has increasingly been demonstrated that group level factors influence individual health outcomes (Deiz-Roux, 1998). Thus, failing to consider variables at the group level will result in an incomplete understanding of the determinants of violence.

Identifying the contextual factors that influence rates of violence within a community by controlling for individual variability within the groups will assist in developing primary prevention approaches to change upstream risk factors (or the risk factors for risk factors). Multilevel analysis also makes it possible for researchers to identify the geographic level at which income inequality plays a role in predicting rates of violence at the community and household levels, thereby ensuring that social/community development efforts are targeted at the level in which income inequality is most associated with violence. While economic policies may be more appropriate at the provincial or national levels, social and human development efforts that influence the potential pathways that link income inequality to violence (such as community cohesiveness, feelings of lack of control, and willingness to act for the benefit of the group) could be implemented at the smaller geographic levels.

By beginning to look at the risk factors for violence and potentially mediating variables through a multilevel framework, we can begin to examine the way in which the social and economic context is affecting violent behaviours and experiences. Through this, analysis on the differences between neighbourhoods can be used to inform decisions with the goal of eliminating disparities in health outcomes. It is time to examine levels of inequality that still pervade many areas of the country and look critically at the effect this has on the health and well-being of individuals who are continually confronted with what others have and what they cannot attain.

5.6.4 Challenges and criticisms of the multilevel approach

This statistical methodology does not come without its pitfalls and challenges. For example, creating an operational definition of 'community' may prove to be difficult, as this term implies more than geographic boundaries. Large studies of group level effects are often reduced to using formal geographic boundaries that may make it difficult to interpret the effects of area level socioeconomic status or other variables if residents themselves don't consider themselves as a part of that unit. In past research 'communities' have been operationalised as census tracts, counties, districts, or even states (Diez-Roux, 2001).

It is also difficult to determine how length of time in the community affects the role it plays in health outcomes, as well as the effect of moving from either a similar or different type of neighbourhood (Diez-Roux, 2001). For example high mobility in an area may result in little or no contextual effect of the area, or the establishment of social or economic policies may change the extent to which the environment has an effect over an individual's health and well-being over time.

If group level contexts are associated with violent or poor health outcomes, there is no doubt in the complexity of the causal pathways (Diez-Roux, 2004). For example, it may be difficult to determine whether the individual level variables are mediators or confounders in the causal pathway, the extent to which the variable at the individual level overlaps with the group level measure of that variable, or to determine temporality of the relationship between the individual and group level variables.

Oakes (2004) challenges the validity of using neighbourhood level variables to measure the 'contextual effect' of the neighbourhood. This argument centres on the inevitable 'dependence' of observations within a given neighbourhood; hence the grouped data that formulates a neighbourhood level variable is not based on independent observations, a key tenet in regression analysis. This presents a problem for causal inference as it is impossible to randomise people to neighbourhoods and there are significant deviations from the counterfactual as a result. In his argument, Oakes stresses that people are often 'selected' into a residential area, for example because of similar socioeconomic status, values, or lifestyle choices and while living in the same area, become more similar through similar exposures and social contact with one another. While a researcher can control for some of these factors, it is impossible to control for all of them without running into significant statistical problems due to sparse data.

Many of these challenges are not unique to the multilevel approach but to all observational studies. While Oakes (2004) has demonstrated the difficulty in drawing causal inference from results using this method that is not to say the method is invalid. Rather, a contextual association found can be used to further develop theories and conduct more specific quantitative studies using more precise community level measurements (Diez-Roux, 2004). It is from this point that intervention studies and qualitative studies can also be of benefit to determine the contextual effects of the environment on individual behaviour and outcomes.

5.7 Linking epidemiological research with intervention and prevention initiatives

5.7.1 Addressing violence with social epidemiology

It is imperative that violence is addressed as a public health problem and analysed in light of the social contexts in which it is highly prevalent. Like other health issues, research on violence needs to focus on populations that have both very high and very low rates of violent injury and death. This is the role of epidemiologic research; to compare and contrast these populations and decipher what the risk and resilience factors are that may begin to explain the differing rates of violence. It is clear that violence is not driven by biologic phenomenon, rather, it stems from social processes at the household or community level. As interest in social epidemiology as a methodology to critically examine more traditional public health issues (that generally have biomedical risk factors as well), it is necessary that this method continues to be applied to the field of violence prevention and intervention research.

Epidemiological studies need to continue investigating the relationship between violence and socioeconomic position, particularly as the social and economic environment in South Africa is rapidly changing. Data can be gathered for quantitative analysis through surveys such as the SADHS, but also through surveillance mechanisms such as the Medical Research Council's National Injury Mortality Surveillance System (NIMSS). Surveillance mechanisms are a critical component to epidemiological research. Data from the surveillance system is analysed to identify the trends and characteristics present in the occurrence of violence within a population. Based on these results violence prevention policies and programmes can then be developed in response. Further surveillance and data analysis is then used to monitor the

occurrence of violence as well as changes in patterns and trends of violence as a way to measure success.

5.7.2 Research implications for developing interventions to reduce violence in South Africa

Currently in South Africa, the response to violence is heavily weighted on the reactive side rather than the preventive one, as response is strongest in the fields of law enforcement and criminal justice. However, it is clear from this research that the issues surrounding violence expand far beyond those that can be addressed through the criminal justice system alone. Violence has an immense impact on the health of an individual as well as the community at large and as a result the field of public health is increasingly taking larger roles in community violence prevention efforts. Using primary prevention as a framework, the public health approach to violence prevention does not focus specifically on offenders; rather they are designed for the community and address multiple risk factors for violence, as well as risk factors for risk factors (often termed as the 'upstream approach').

South Africa is rapidly expanding their surveillance mechanisms through the development of the National Non-Fatal Injury Surveillance System (NANFISS) that looks specifically at violent injury as well as other types of injury. However, data from the NANFISS remains very limited. In the future, data from these surveillance systems could juxtapose that of the SADHS for a more complete national profile of violence. It would be beneficial if the survey data and surveillance data were able to merge on a geographic level so that socioeconomic variables from survey data could be used in the analysis of surveillance data (which may have a more accurate picture of violence as responder bias would be eliminated).

Based on the patterns of violence and risk factors identified through surveillance and epidemiological analysis, it is important to set measurable goals to reduce violence and develop interventions to meet those goals. For example, this analysis found that employment was a risk factor for violence at the individual level, yet employment of the household head was protective against violence within the household. Further investigation is needed to decipher the pathways that may cause employment to be a risk factor for violence. Could it be due to the nature of the informal sector in which a majority of South Africans work? Is it due to a greater chance of being in unsafe areas due to commuting to and from work (which is frequently on foot or through mini-bus taxi's, an industry where violent occurrences are common (Gilbert, 1996)). Once these pathways can be more distinctly identified, specific interventions such as creating safer outdoor spaces for pedestrians in frequently travelled areas, or involving more community response and crime prevention teams in and around taxi ranks, can be designed and implemented.

REFERENCES

Ahmed R, Seedat M, van Niekerk A, and Bulbulia S. (2004). Discerning community resilience in disadvantaged communities in the context of violence and injury prevention. *South African Journal of Psychology* 34(3):386-408.

Allan A, Roberts MC, Allan MM, Pienaar WP, Stein DJ. (2001). Intoxication, criminal offences and suicide attempts in a group of South African problem drinkers. *South African Medical Journal,* 91(2):145-50.

Amoakohene, MI. (2004). Violence against women in Ghana: a look at women's perceptions and review of policy and social responses. *Social Science & Medicine,* 59(11):2373-85.

Arthur, JA. (1991). Socioeconomic predictors of crime in rural Georgia. *Criminal Justice Review,* 16, 29-41.

Backlund E, Sorlie PD, and Johnson NJ. (1996). The shape of the relationship between income and mortality in the United States: evidence from the national longitudinal mortality study. *Annals of Epidemiology*, 6:1-9.

Bangdiwala SI, Ramiro L, Sadowski LS, Bordin, IA, Hunter W, and Shankar V. (2004). Intimate partner violence and the role of socioeconomic indicators in WorldSAFE communities in Chile, Egypt, India and the Philippines. *Injury Control and Safety Promotion,* 11(2):101-9.

Blakely T, O'Dea D, and Atkinson J. (2003). No association of income inequality with adult mortality within New Zealand. *Journal of Epidemiology and Community Health*, 57:279-84.

Blau JR and Blau PM. (1982). The cost of inequality: Metropolitan structure and violent crime. *American Sociological Review,* 47:114-29.

Booysen F. (2001). Chapter 2: The Measurement of Poverty. In: Bradshaw D and Steyn K (eds.) Poverty and Chronic Diseases in South Africa: Technical Report 2001.

Bowley DM, Rein P, Cherry R, Vellema J, Snyman T, Boffard KD. (2004). Substance abuse and major trauma in Johannesburg. *South African Journal of Surgery,* 42(1):7-10.

Bradshaw D, Groenwald P, Laubscher R, Nannan N, Nojilana B, Norman R, Pieterse D, Schneider M, Bourne DE, Timaeus IM, Dorrington R, Johnson L. (2003). Initial burden of disease estimates for South Africa, 2000. *South African Medical Journal* 93(9):683-688.

Bradshaw D, Johnson L, Schneider H, Bourne D, and Dorrington R. (2002). Orphans of the HIV/AIDS epidemic: The time to act is now. MRC Policy Brief. No 2, May.

Bradshaw D and Steyn K. (2001). Poverty and Chronic Diseases in South Africa. Technical Report of the Medical Research Council; Cape Town.

Bray R. (2003). Predicting the social consequences of orphanhood in South Africa. *African Journal of AIDS Research,* 2(1):39-55.

Buchsbaum DG, Buchanan RG, Centor RM, Schnell SH, and Lawton MJ. (1991). Screening for alcohol abuse using CAGE scores and likelihood ratios. *Annals of Internal Medicine* 115(10):774-77.

Burrows S, Vaez M, Butchart A, and Laflamme L. (2003). The share of suicide in injury deaths in the South African context: sociodemographic distributions. *Public Health,* 117(1):3-10.

Burton P, du Plessis A, Leggett T, Louw A, Mistry D, and van Vuuren H. (2004). National Victims of Crime Survey South Africa 2003. Institute for Security Studies, Monograph 101; Pretoria.

Butchart A and Brown DSO. (1991). Non-fatal injuries due to interpersonal violence in Johannesburg-Soweto: Incidence, determinants and consequences. *Forensic Science International,* 52(1):35-51.

Centre for the Study of Violence and Reconciliation (CSVR). (1998). Into the heart of darkness: Journeys of the Amagents in crime, violence, and death. For the Council for Scientific and Industrial Research.

Diez Roux AV. (1998). Bringing context back into epidemiology: variables and fallacies in multilevel analysis. *American Journal of Public Health* 88:216-222.

_____. (2001). Investigating area and neighborhood effects on health. *American Journal of Public Health* Nov; 91(11):1783-9.

_____. (2004). Estimating neighborhood health effects: the challenges of causal inference in a complex world. *Social Science & Medicine,* 58:1953-60.

Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntyre JA, and Harlow SD. (2004). Gender-based violence, relationship power, and risk of HIV infection among women attending antenatal clinics in South Africa. *The Lancet,* 363:1415-21.

Ecob R and Davey Smith G. (1999). Income and health: what is the nature of the relationship? *Social Science & Medicine,* 48:693-705.

Engels F. (1968). *The conditions of the working class in England.* Stanford, CA: Stanford University Press.

Ewing JA. (1974). Behavioral approaches for problems with alcohol. *International Journal of Addiction,* 9(3):389-99.

Fisher AJ and Charlton DO. (2001). Urbanisation and adolescent risk behaviour. *South African Medical Journal;* 91(3):243.

Gabor T, Welsh B, and Antonowicz DH. (1996). The role of the health community in the prevention of criminal violence. *Canadian Journal of Criminology*, July:317-333.

Gianini RJ, Litvoc J, and Eluf Neto J. (1999). Physical aggression and social class. *Rev Saude Publication,* 33(2):180-6.

Gilbert L. (1996). Urban violence and health- South Africa 1995. *Social Science & Medicine*, 43(5):873-86.

Goosen J, Bowley DM, Degiannis E, and Plani F. (2003). Trauma care systems in South Africa. *Injury, International Journal of the Care of the Injured*; 34:704-8.

Groenwald P, Bradshaw D, Nojilana B, Bourne D, Nixon J, Mahomed H, and Daniels J. (2003). *Cape Town Mortality, 2001, Part I, Cause of death and premature mortality.* Cape Town: City of Cape Town, South African Medical Research Council, University of Cape Town.

Hamber B and Lewis S. (1997). An overview of the consequences of violence and trauma in South Africa. Centre for the Study of Violence and Reconciliation; Johannesburg.

Hamber B. (1999). "Have no doubt it is fear in the land." An exploration of the continuing cycles of violence in South Africa. *South African Journal of Child and Adolescent Mental Health,* 12(1):5-18.

Hox JJ. (2002). Multilevel Analysis. Techniques and Applications. Mahwah, NJ: Lawrence Erlbaum Associates.

Hsieh C and Pugh MD. (1993). Poverty, income inequality, and violent crime: A meta-analysis of recent aggregate data studies. *Criminal Justice Review,* 18;2:182-202.

Jewkes R and Abrahams N. (2002). The epidemiology of rape and sexual coercion in South Africa: an overview. *Social Science & Medicine,* 55:1231-44.

Jewkes R, Levin J, Penn-Kekana L. (2002). Risk factors for domestic violence: findings from a South African cross-sectional study. *Social Science & Medicine,* 55(9):1603-17.

Jones K, Duncan C, Twigg L. (2004). Evaluating the absolute and relative income hypothesis in an exploratory analysis of deaths in the Health and Lifestyle Survey. In: Boyle P, Curtis S, Graham E, eds. The geography of health inequalities in the developed world. London, United Kingdom: Ashgate Press.

Kaplan GA. (2004). What's wrong with social epidemiology, and how can we make it better? *Epidemiologic Reviews.* 26:124-35.

Kawachi I, Kennedy BP, and Wilkinson RG. (1999). Crime: social disorganization and relative deprivation. *Social Science & Medicine,* 48:719-31.

Kennedy BP, Kawachi I, and Prothrow-Stith D. (1996). Income distribution and mortality: Cross-sectional ecological study of the Robin Hood Index in the United States. *British Medical Journal*, 312:1004-7.

Kennedy BP, Kawachi I, Prothrow-Stith D, Lochner K, and Gupta V. (1998). Social capital, income inequality, and firearm violent crime. *Social Science & Medicine.* 47(1):7-17.

Krahn H, Hartnagel TF, and Gartrell JW. (1986). Income inequality and homicide rates: Cross-national data and criminological theories. *Criminology,* 24:269-95.

Krieger N. (1994). Epidemiology and the web of causation: has anyone seen the spider? *Social Science & Medicine,* 39:887-903.

_____. (2001). A glossary for social epidemiology. *Journal of Epidemiology and Community Health.* 55:693-700.

Krieger N, Rowley D, Hermann AA, Avery B, and Phillips MT. (1993). Racism, sexism, and social class: implications for studies of health, disease, and well-being. *American Journal of Preventive Medicine,* 9 Suppl 6:82-122.

Krieger N, Williams DR, and Moss NE. (1997). Measuring social class in U.S. public health research: concepts, methodologies and guidelines. *Annual Review of Public Health,* 18:341-78.

Krug EG, Dahlberg LL, Mercy JA, Zwi AB, and Lozano R. (eds). (2002). *World Report on Violence and Health.* Geneva, World Health Organization.

Lester D. (1984). The association between the quality of life and suicide and homicide rates. *Journal of Social Psychology*, 124:247—8.

Link BJ, and Phelan J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior,* 35(Extra Issue: Forty Years of Medical Sociology: The State of the Art and Directions for the Future):80-94.

London L. (2000). Alcohol consumption amongst South African farm workers: a challenge for post-apartheid health sector transformation. *Drug and Alcohol Dependency,* 59(2):199-206.

Lynch J, and Kaplan G. (2000). Socioeconomic Position. In: Berkman LF, and Kawachi I. (Eds.), *Social Epidemiology*. New York: Oxford University Press, 2:13-35.

Mackenbach JP, and Kunst AE. (1997). Measuring the magnitude of socioeconomic inequalities in health: an overview of available measures illustrated with two examples from Europe. *Social Science & Medicine,* 44:757-71.

Marais S, Van der Spuy E, and Rontsch R. (2002). Crime and violence in the workplace-Effects on health workers, Part II. *Injury and Safety Monitor,* 1(1):8-12.

Masuku S. (2002). Prevention is better than cure: Addressing violent crime in South Africa. *South African Crime Quarterly,* 2:5-12.

Mathews S, Abrahams N, Martin LJ, Vetten L, van der Merwe L, and Jewkes R. (2004). "Every six hours a woman is killed by her intimate partner": A National Study of Female Homicide in South Africa. MRC Policy brief, No. 5. Cape Town.

Matzopoulos R, Cassim M, and Seedat M. (2003). A profile of fatal injuries in South Africa. Fourth Annual Report of the National Injury Mortality Surveillance System. Crime, Violence and Injury Lead Programme, Medical Research Council; Cape Town.

Matzopoulos R, Norman R, and Bradshaw D. (2004). The burden of injury in South Africa: Fatal injury trends and international comparisons. In: Suffla, S, Van Niekerk A (Eds.) and Duncan, N (Cons. Ed.). *Crime, Violence and Injury Prevention in South Africa: Developments and Challenges.* Medical Research Council- University of South Africa. Crime, Violence and Injury Lead Programme; Tygerberg, South Africa.

Mayer SE and Jencks C. (1989). Growing up in poor neighborhoods: how much does it matter? *Science*, 243(4897):1441-6.

Measure DHS. (2005). Demographic and Health Surveys: History. Available at: http://www.measuredhs.com/aboutdhs/history.cfm. Accessed on 22 July 2005.

Merton, RK. (1968). Social Structure and Anomie. In: Social Theory and Social Structure. Free Press; New York.

Messner, SF. (1983). Regional differences in the economic correlates of the urban homicide rate. Some evidence on the importance of cultural context. *Criminology*. 21, 477-88.

Monasch R and Boerma JT. (2004). Orphanhood and childcare patterns in sub-Saharan Africa: an analysis of national surveys from 40 countries. AIDS 18(suppl 2):S55-S65.

Montgomery MR, Gragnolati M, Burke KA, Paredes E. (2000). Measuring living standards with proxy variables. *Demography*, 37(2):155-74.

Myer L, Ehrlich RI, and Susser ES. (2004). Social Epidemiology in South Africa. *Epidemiologic Reviews,* 26:112-36.

Norman R. (2005). Medical Research Council, Cape Town. Personal communication.

Norman R, Bradshaw D, and Steyn K. (2001). Chapter 4 : Chronic Diseases, Risk Factors and Lifestyles Based on the South African Adult Demographic and Health Survey. In : Bradshaw D and Steyn K (Eds.) Poverty and Chronic Diseases in South Africa, Technical Report 2001. Medical Research Council ; Cape Town.

Oakes JM. (2004). The (mis)estimation of neighbourhood effects: causal inference for a practicable social epidemiology. *Social Science & Medicine,* 58:1929-52.

Osler M, Prescott E, Gornbaek M, et al. (2002). Income inequality, individual income, and mortality in Danish adults: analysis of pooled data from two cohort studies. *British Medical Journal,* 324:13-16.

Parry CDH, Pluddemann A, Steyn K, Bradshaw D, Norman R, Laubscher R. (2005). Alcohol use in South Africa: findings from the first Demographic and Health Survey (1998). *Journal of Studies on Alcohol,* 66(1):91-7.

Pearce N. (2004). The globalization of epidemiology: Introductory remarks. *International Journal of Epidemiology,* 33:1-5.

Peden M and Van der Spuy J. (1998). The cost of treating firearm victims. *Trauma Review,* 6:4-5.

Pick WM, Ross MH, and Dada Y. (2002). The reproductive and occupational health of women street vendors in Johannesburg, South Africa. *Social Science & Medicine,* 54(2):193-204.

Prinsloo M. (2004). Factors impacting on the criminal investigation process in Cape Town. *Injury and Safety Monitor*; 3(2): 5-8. Medical Research Council, Cape Town; South Africa.

Raudenbush SW, and Bryk AS. (2002). Hierarchical Linear Models: Applications and data analysis methods (2nd Edition). Thousand Oaks, CA: Sage.

Robins TG, Salie F, and Gwagwa T. (1998). Occupational hazards, living conditions, and physical assault of sugar cane workers in KwaZulu-Natal, South Africa. *Social Science & Medicine,* 88(9):1117-27.

Rothman KJ, and Greenland S. (1998). Modern Epidemiology (2nd edition). Philadelphia: Lippincott-Raven.

Sampson RJ, Raudenbush SW, and Earls F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science,* 277:918-24.

Schonteich M and Louw A. (2001). Crime in South Africa: A country and cities profile. Crime and Justice Programme, Institute for Security Studies. Occasional Paper No 49; Pretoria, South Africa.

Seedat S, Nyami C, Njenga F, Vythilingum B, Stein DJ. (2004). Trauma exposure and post-traumatic stress symptoms in urban African schools. *British Journal of Psychiatry,* 184:169-75.

Shaw C. and McKay H. (1942). *Juvenile Delinquency and Urban Areas.* Chicago: University Press.

Shibuya K, Hashimoto H, Yano E. (2002). Individual income, income distribution, and self rated health in Japan: cross sectional analysis of nationally representative sample. *British Medical Journal,* 324:16-19.

South Africa Demographic and Health Survey 1998: Full Report. Medical Research Council; Cape Town.

South African Human Development Report 2003. The Challenge of Sustainable Development in South Africa: Unlocking People's Creativity. UNDP South Africa, Oxford University Press; Cape Town.

Standing A. (2003). The social contradictions of organised crime on the Cape Flats. Institute for Security Studies, Paper 74; Pretoria.

Subramanian SV and Kawachi I. (2004). Income Inequality and Health: What have we learned so far? *Epidemiologic Reviews.* 26:78-91.

Thomson JDS. (2004). A murderous legacy: Coloured homicide trends in South Africa. *SA Crime Quarterly*, 7:9-14.

Van der Spuy J. (1993). Violence in Perspective. *Trauma Review*, 1(2):1.

Veenstra G. (2000). Social capital, SES and health: an individual-level analysis. *Social Science & Medicine,* 50:619-29.

Vogelman L and Simpson G. (1991). A legacy of youth violence haunts apartheid. *Psychology International*, 2(1).

Wagstaff A, and van Doorslaer E. (2002). Income inequality and health: What does the literature tell us? *Annual Review of Public Health,* 21:543-67.

Wallace D, and Wallace R. (1998). Scales of geography, time, and population: the study of violence as a public health problem. *American Journal of Public Health,* 88(12):1853-8.

Waters H, Hyder A, Rajkotia Y, Basu S, Rehwinkel JA, Butchart A. (2004). *The economic dimensions of interpersonal violence.* Department of Injuries and Violence Prevention, World Health Organization, Geneva.

Wilkinson, RG. (1994). The epidemiological transition: from material scarcity to social disadvantage? (Health and Wealth). *Daedalus,* 123;4:61-78.

Wilkinson RG. (1997). Socioeconomic determinants of health: Health inequalities: relative or absolute material standards? *British Medical Journal,* 314:591.

Williams DR. (1990). Socioeconomic Differentials in Health: A Review and Redirection. *Social Psychology Quarterly,* 53(2):81-99.

Wilson WJ. (1987). The Truly Disadvantaged: the Inner City, the Underclass and Public Policy. University of Chicago Press, Chicago.

Wood K and Jewkes R. (1997). Violence, rape, and sexual coercion: everyday love in a South African township. *Gender and Development,* 5(2):41-46.

World Bank. (2004). Economic Growth Research: Deininger and Squire Data Set: A New Data Set Measuring Income Inequality. Available at: http://www.worldbank.org/research/growth/dddeisqu.htm. Accessed on 9 October 2004.

APPENDIX A: Person, Women, and Household Questionnaires from the 1998 South African Demographic and Health Survey

12/1/98

SOUTH AFRICAN DEMOGRAPHIC AND HEALTH SURVEY
ADULT HEALTH QUESTIONNAIRE

IDENTIFICATION

PROVINCE _____

DISTRICT _____

EA NUMBER .....

EA TYPE .....

SADHS CLUSTER NUMBER .....

HOUSEHOLD NUMBER .....

NAME AND LINE NUMBER OF ADULT _____

NAME OF HOUSEHOLD HEAD _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR
INTERVIEWER'S NAME				NAME
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NO. OF VISITS
TIME				

*RESULT CODES:
1 COMPLETED
2 NOT AT HOME
3 POSTPONED
4 REFUSED
5 PARTLY COMPLETED
6 INCAPACITATED
7 OTHER _____ (SPECIFY)

LANGUAGE

LANGUAGE OF QUESTIONNAIRE .....

LANGUAGE OF INTERVIEW .....

HOME LANGUAGE OF RESPONDENT .....

TRANSLATOR USED (YES = 1, NO = 2) .....

LANGUAGE CODES

01 ENGLISH	04 isi ZULU	07 SePEDI	10 ZITSONGA
02 AFRIKAANS	05 SeSOTHO	08 SISWATI	11 isiNDEBELA
03 isiXHOSA	06 SeTSWANA	09 TshiVENDA	

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME _____	NAME _____		
DATE _____	DATE _____		

SECTION 1: HEALTH SERVICE UTILIZATION

NO.	QUESTIONS AND FILTERS							
1.	During the last month have you been to any of the following health services for medical care for yourself : PROBE				2. Were you satisfied with the care you received at (PLACE)?		3. Why were you not satisfied with the care you received at (PLACE)?	
A	Day Hospital?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
B	Government Hospital/Government Clinic?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
C	Private Hospital/Private Clinic?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
D	District Surgeon?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
E	Private Doctor?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
F	Chemist Shop?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
G	Faith Healer?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
H	Traditional Healer or Herbalist?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	
I	Health Services at the Workplace?	YES	NO		YES	NO	LONG WAIT	01
		1	2 ┐		1 ┐	2	SHORT CONSULTATION	02
		▼			▼		STAFF RUDE/UNKIND	03
							DIDN'T SEE DOCTOR	04
							OTHER_____	96
							(SPECIFY)	

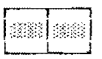
J	Home Based Care Services/House visits?	YES 1 ▼ / NO 2 ┐	YES 1 ┐ ▼ / NO 2	LONG WAIT ..... 01 SHORT CONSULTATION ..... 02 STAFF RUDE/UNKIND ..... 03 DIDN'T SEE DOCTOR ..... 04 OTHER_____ 96 (SPECIFY)
K	Dentist/Oral hygienist/Oral therapist?	YES 1 ▼ / NO 2 ┐	YES 1 ┐ ▼ / NO 2	LONG WAIT ..... 01 SHORT CONSULTATION ..... 02 STAFF RUDE/UNKIND ..... 03 DIDN'T SEE DOCTOR ..... 04 OTHER_____ 96 (SPECIFY)
L	Other? _____ SPECIFY	YES 1 / NO 2		

4.	Are you covered by a Medical Aid or Medical Benefit Scheme? (Any scheme that helps you pay for health/drug services)	YES ..... 1 NO 2	
5.	Have you had your blood pressure measured in the past 12 months?	YES ..... 1 NO 2	
6.	Do you know what your blood pressure is?	YES ..... 1 NO 2	→ 8
7.	Is it high, normal or low?	HIGH ..... 1 NORMAL ..... 2 LOW ..... 3 DON'T KNOW 8	

SECTION 2: FAMILY MEDICAL HISTORY

8	Now I would like to ask you about your family. Do you have a close blood relative (father, mother, brother, sister or child) who has ever had any of the following conditions:		
8A	High Blood Pressure?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
8B	Heart attack or angina or chest pain when exerting himself/herself?	YES ..... 1 NO ..... 2 DON'T KNOW 8	┐→ 8D
8C	IF "YES", was it before the age of 50 years?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
8D	Stroke?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
8E	High blood cholesterol or Fats?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
8F	Diabetes or Blood Sugar?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
8G	Cancer?	YES ..... 1 NO ..... 2 DON'T KNOW 8	

SECTION 9: CLINICAL CONDITIONS

9	Now I would like to ask you about your own health. Has a doctor or nurse or staff member at a clinic or at hospital told you that you had or have any of the following conditions:		
9A	High Blood Pressure?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9C
9B	IF "YES", when was the first time that you were told you had high blood pressure?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9C	Heart attack or angina?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9E
9D	IF "YES", when was your heart attack or angina?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9E	Stroke?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9G
9F	IF "YES", when did you have your stroke?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9G	High blood cholesterol or fats?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9I
9H	IF "YES", when was the first time that you were told that you had blood cholesterol or fats?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9I	Diabetes or Blood Sugar?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9K
9J	IF "YES", when was the first time that you were told that you had diabetes or blood sugar?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9K	Emphysema/Bronchitis?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9M
9L	IF "YES", when was the first time that you were told that you had emphysema or bronchitis?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9M	Asthma?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9O
9N	IF "YES" when was the first time that you were told that you had asthma?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9O	TB?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→9Q
9P	IF "YES" when was the first time that you were told that you had TB?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	
9PP	How many episodes of TB have you ever been treated for?		
9Q	Cancer?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→12
9R	IF "YES", when was the first time that you were told that you had cancer?	IN THE LAST 12 MONTHS ..... 1 MORE THAN A YEAR AGO 2	

10	Did the doctor/nurse/staff member at a hospital tell you what kind of cancer you have?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→12
11	What kind of cancer were you told you had or have? DO NOT READ THE LIST OF CANCERS.	LUNG CANCER ..... A CERVICAL/WOMB CANCER ..... B SKIN CANCER ..... C BREAST CANCER ..... D PROSTATE CANCER ..... E ESOPHAGEAL CANCER ..... F OTHER_____ X (SPECIFY)	
12	Do you feel you have less breath when exerting yourself when compared to other people your age?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
13	During the last year have you had wheezing or tightness of your chest.	YES ..... 1 NO ..... 2 DON'T KNOW 8	→16
14	If "YES" were you also short of breath?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
15	Do you only get wheezing when you have a cold?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
16	Is your sleep ever interrupted by you coughing?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
17	Is your sleep ever interrupted by wheezing or a tight chest?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
18	Do you usually cough?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→21
19	When you cough, do you usually bring up phlegm from your chest?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→21
20	If "yes", have you brought up phlegm every day for at least three months during the last year?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→21
20A	If "yes" for how many years have you brought up phlegm in this way?		
21	IS THE RESPONDENT A MAN OR A WOMAN?	MAN ☐ WOMAN ☐	→26
22	Now I am going to ask you some personal questions. Please remember that this information will be kept strictly confidential. Some men experience pain during urination or have a discharge from the penis. During the last 3 months, have you noticed any such pain or discharge?	YES ..... 1 NO 2	
24	Some men experience sores in the genital area. During the last 3 months, have you noticed any such sores?	YES ..... 1 NO 2	

SECTION 4: DENTAL HEALTH

26	Now i want to esk you about your teeth. Do you think that there is anything wrong in your mouth, teeth or gums?	YES ..... 1 NO 2	→28
27	Which of the following items do you feel is a problem: Your Teeth? Your Gums? Ulcers/sores in the mouth? Dentures? Any other problems? RECORD ALL MENTIONED.	 TEETH ..... A GUMS ..... B ULCERS/SORES IN THE MOUTH ... C DENTURES ..... D OTHER _____ X (SPECIFY)	
28	Have you ever visited a dentist, an orel hygienist, or an oral therapist ?	YES ..... 1 NO 2	
29	Have you lost any of your natural teeth?	YES ..... 1 NO 2	→34
30	Do you have any of your naturel teeth?	YES ..... 1 NO 2	
31	Do you wear e denture (false teeth)?	YES, PARTIAL ..... 1 YES, TOTAL/COMPLETE ..... 2 NO 3	
32	CHECK 30: HAS NO NATURAL TEETH	HAS NATURAL TEETH → 34	
33	Do you usually rinse or clean your mouth everyday?	YES ..... 1 NO 2	→ 38
34	What do you do to look after your teeth. Do you Clean/Brush your teeth? Watch your diet/Eet speciel foods? Visit the dentist? Anything else?	YES NO CLEAN/BRUSH ..... 1 2 DIET/FOOD ..... 1 2 VISIT DENTIST ..... 1 2 OTHER_____1 2 (SPECIFY)	
35	CHECK 34: CLEAN/BRUSH	DOES NOT CLEAN/BRUSH → 37	
36	Do you usually brush/wash your teeth everyday?	YES ..... 1 NO 2	
37	Do you own a toothbrush?	YES ..... 1 NO 2	

38	Some people say that fluoride mineral in the water makes the children and adults' natural teeth strong and healthy; Other people say it does not. What do you think?	MAKES TEETH STRONG . . . . . 1 DOES NOT MAKE TEETH STRONG . 2 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	

SECTION 5: OCCUPATIONAL HEALTH

39	In the last 12 months, have you worked for payment?	YES . . . . . 1 NO 2	——→45A
40	In the last 12 months, have you had any injury or health problem related to your work?	YES . . . . . 1 NO 2	——→43
41	Did you stay away from work because of this injury or problem?	YES . . . . . 1 NO 2	
42	What was the injury or health problem?		
43	In the last 12 months, have you had an existing injury or health problem that was aggravated or became worse at work?	YES . . . . . 1 NO 2	——→45A
44	Did you stay away from work because of this injury or problem?	YES . . . . . 1 NO 2	
45	What was the injury or health problem?		
45A	Have you ever worked underground in a mine?	YES . . . . . 1 NO 2	——→46
45B	If "yes", what kind of mine was it? RECORD ALL	GOLD . . . . . A COAL . . . . . B ASBESTOS . . . . . C OTHER _____ X (SPECIFY)	
45C	How many years in total did you work underground?		

SECTION 6: MEDICATION

46	Now I want to ask you about any medication you take. Do you use any medicine regularly that has been prescribed by a doctor or nurse?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→65
47	How many different medicines do you use regularly?	NUMBER	
48	Do you know what the medication is for?	YES ..... 1 NO 2	→65
49	Is it for **High Blood Pressure?**	YES ..... 1 NO ..... 2 DON'T KNOW 8	→51
50	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES ..... 1 NO 2	→51
51	Is it for **Diabetes/Sugar?**	YES ..... 1 NO ..... 2 DON'T KNOW 8	→53

52	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES . . . . . 1 NO . . . . . 2 ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘	→53
53	Is it for **High Blood Cholesterol**?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→55
54	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES . . . . . 1 NO . . . . . 2 ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘ ⌐¬ _____ |▒| └┘	→55
55	Is it for **Angina/chestpain**?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→57

56	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES ..... 1 NO ..... 2 ⌐¬ ⌐¬ ⌐¬ ⌐¬ ⌐¬ ⌐¬	→57
57	Is it for any other **Heart condition**?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→59
58	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES ..... 1 NO ..... 2 ⌐¬ ⌐¬ ⌐¬ ⌐¬ ⌐¬ ⌐¬	→59
59	Is it for **Asthma, Emphysema or Bronchitis**?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→61

60	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES . . . . . 1 NO 2	→ 61
61	Is it for **Tuberculosis**?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 63
62	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES . . . . . 1 NO 2	→ 63
63	Do you take it because you had a **Stroke**?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 65

64	Can you name the medication? WRITE DOWN THE NAME(S) OF THE MEDICATION.	YES .... 1 NO 2	 →65

65	NOW, ASK THE RESPONDENT TO SHOW YOU ALL THE MEDICATION TAKEN EVERY DAY DURING THE LAST MONTH. THEN WRITE DOWN THE NAMES OF ALL THE MEDICATIONS BELOW. NAME _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐ _____ ☐☐☐☐☐☐☐	MEDICATIONS ARE LISTED YES.....1 NO.....2 →66 NUMBER OF MEDICATIONS LISTED ..... ☐☐
65A	Who pays for most of the prescribed medication that you use?	RESPONDENT ..... 01 FAMILY ..... 02 MEDICAL AID ..... 03 PROVIDED AT CLINIC OR PUBLIC HOSPITAL ..... 04 EMPLOYER ..... 05 OTHER _____ 96 (SPECIFY)

SECTION 7: HABITS AND LIFESTYLE

Now I would like to ask you a few questions about your diet and other habits.

66	How old were you at your last birthday?	AGE IN COMPLETED YEARS .... ▒▒	
66a	Which race group do you consider yourself?	BLACK/AFRICAN ..... 1 COLOURED ..... 2 WHITE ..... 3 ASIAN/INDIAN 4	
67	Do you usually eat your food very salty, lightly salted or not salted?	VERY SALTY ..... 1 LIGHTLY SALTED ..... 2 NOT SALTED ..... 3 DON'T KNOW 8	
68	Do you usually add salt or Aromat/Fondor to your serving of food? IF YES, Before or after tasting the food?	NO, I NEVER ADD SALT/AROMAT ..... 1 YES, BUT I TASTE FIRST AND THEN ADD . 2 YES, EVEN BEFORE HAVING TASTED FOOD 3 DON'T KNOW 8	
69	Do you eat salty snacks more often than three times per week (Such as chips, niknaks, salted peanuts, salty biscuits, biltong, dried sausage, dried fish)?	YES ..... 1 NO 2	
70	Do you personally think that you are underweight,normal weight or overweight?	UNDERWEIGHT ..... 1 NORMAL WEIGHT ..... 2 OVERWEIGHT.. ..... 3 DON'T KNOW 8	
71	Have you ever smoked tobacco, used snuff or chewed tobacco?	YES ..... 1 NO 2	——→81
72	Have you ever smoked at least 100 cigarettes (5 packets of 20 cigarettes) or the equivalent amount of tobacco in your lifetime?	YES ..... 1 NO 2	
73	Have you ever smoked daily?	YES ..... 1 NO 2	
74	On average, what number of the following items do or did you smoke or use per day? PROBE AND FILL IN NUMBER FOR EACH ITEM.	MANUFACTURED CIGARETTES ▒▒ HAND-ROLLED CIGARETTES ▒▒ PIPEFULS OF TOBACCO ▒▒ CIGARS/CHEROOTS/CIGARILLOS ▒▒ SNUFF ▒▒ CHEWING TOBACCO/PRUIMPIE ▒▒	
75	CHECK 74: EVER SMOKED CIGARETTES, PIPES OR CIGARS ▒ ▼	USES SNUFF OR CHEWING TOBACCO ▒ → 81	
76	How many years have you smoked or did you smoke on a daily basis? (IF RESPONDENT HAS STOPPED AND STARTED AGAIN, ASK FOR TOTAL YEARS)	NUMBER OF YEARS ..... ▒▒	

77	How old were you when you started smoking regularly?	AGE IN YEARS..... ▒▒	
78	Have you ever tried to quit smoking?	YES ..... 1 NO 2	
79	Do you now smoke daily, occasionally or not at all?	DAILY ..... 1 OCCASIONALLY ..... 2 NOT AT ALL 3	——▸81
80	How long has it been since you last smoked daily?	LESS THAN (<)1 MONTH ..... 01 1 MONTH TO < 8 MONTHS ..... 02 8 MONTHS TO < 1 YEAR ..... 03 1 YEAR TO < 5 YEARS ..... 04 5 YEARS TO < 10 YEARS ..... 05 10 YEARS OR MORE ..... 06 NOT APPLICABLE 08	
81	Some people think that smoking is harmful to one's health; Other people think that smoking is good for your health; Some people think it does not matter to one's health whether one smokes or not. What do you think?	HARMFUL TO ONE'S HEALTH ..... 1 GOOD FOR ONE'S HEALTH ..... 2 DOES NOT MATTER 3	
82	Do you live in a house where other people smoke cigarettes regularly?	YES ..... 1 NO 2	
83	Do you now work in a job where other people smoke cigarettes around you?	YES ..... 1 NO ..... 2 I DON'T WORK 8	
84	Have you ever worked in a job where you were regularly exposed to smoke, dust, fumes or strong smells?	YES ..... 1 NO 2	——▸86
85	How long did you work in that job? IF LESS THAN 1 YEAR, WRITE '00'.	YEARS ..... ▒▒	
88	Have you ever drunk alcohol?	YES ..... 1 NO 2	–▸anthro
87	Do you drink alcohol now?	YES ..... 1 NO 2	——▸90
88	How much alcohol do you drink on average during the week?	NO DRINKING DURING THE WEEK ..... 1 1-2 DRINKS PER DAY ..... 2 3-4 DRINKS PER DAY ..... 3 5 OR MORE DRINKS PER DAY ..... 4 COMMUNAL DRINKING 5	
89	How much alcohol do you drink on average on weekends?	NO DRINKING DURING WEEKEND ..... 1 1-2 DRINKS PER DAY ..... 2 3-4 DRINKS PER DAY ..... 3 5 OR MORE DRINKS PER DAY ..... 4 COMMUNAL DRINKING 5	
90	Have you ever felt that you should cut down on your drinking?	YES ..... 1 NO 2	
91	Have people annoyed you by criticizing your drinking?	YES ..... 1 NO 2	
92	Have you ever felt bad or guilty about your drinking?	YES ..... 1 NO 2	
93	Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?	YES ..... 1 NO 2	

ADULT DEMOGRAPHIC AND HEALTH SURVEY
ANTHROPOMETRIC DATA SHEET

94	DATE	d d m m 1 9 y y
95	FIELDWORKER NUMBER	
96	WEIGHT (KG)	
97	HEIGHT (CM)	
98	MID-UPPER-ARM CIRCUMFERENCE (CM)	
99	WAIST CIRCUMFERENCE (CM)	
100	HIP CIRCUMFERENCE (CM)	
101	SYSTOLIC BLOOD PRESSURE 1	
102	DIASTOLIC BLOOD PRESSURE 1	
103	PULSE 1	
104	SYSTOLIC BLOOD PRESSURE 2	
105	DIASTOLIC BLOOD PRESSURE 2	
106	PULSE 2	
107	SYSTOLIC BLOOD PRESSURE 3	
108	DIASTOLIC BLOOD PRESSURE 3	
109	PULSE 3	
110	PEAK EXPIRATORY FLOW RATE	

19/1/98

SOUTH AFRICAN DEMOGRAPHIC AND HEALTH SURVEY
HOUSEHOLD SCHEDULE

IDENTIFICATION

PROVINCE _____

DISTRICT _____

EA NUMBER .....

EA TYPE .....

SADHS CLUSTER NUMBER .....

HOUSEHOLD NUMBER .....

NAME OF HOUSEHOLD HEAD _____

IS HOUSEHOLD SELECTED FOR ADULT HEALTH 1 = YES 2 = NO

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY
PHONE NUMBER				MONTH
				YEAR
INTERVIEWER'S NAME				NAME
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NO. OF VISITS
TIME				

*RESULT CODES:

1 COMPLETED
2 NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT HOME AT TIME OF VISIT
3 ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
4 POSTPONED
5 REFUSED
6 DWELLING VACANT OR ADDRESS NOT A DWELLING
7 DWELLING DESTROYED
8 DWELLING NOT FOUND
9 OTHER _____ (SPECIFY)

TOTAL IN HOUSEHOLD

TOTAL ADULTS 15 YEARS AND OVER

TOTAL WOMEN 15-49 YEARS

LINE NO. OF RESP. TO HOUSEHOLD SCHEDULE

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME _____	NAME _____		
DATE _____	DATE _____		

HOUSEHOLD SCHEDULE

* CODES FOR Q.3

RELATIONSHIP TO HEAD OF HOUSEHOLD:
01 = HEAD
02 = WIFE/HUSBAND/PARTNER
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 =NIECE/NEPHEW
10 =OTHER RELATIVE
11 = ADOPTED/FOSTER/STEP CHILD
12 = NOT RELATED
98 = DON'T KNOW

** CODES FOR Q.10 (EDUCATION GRADE)
00 = LESS THAN 1 YEAR COMPLETED
71 = SUB A/CLASS 1
72 = SUB B/CLASS 2
01 = STANDARD 1
02 = STANDARD 2
03 = STANDARD 3
04 = STANDARD 4
05 = STANDARD 5
06 = STANDARD 6
07 = STANDARD 7
08 = STANDARD 8
09 = STANDARD 9
10 = STANDARD 10
11 = FURTHER STUDIES INCOMPLETE
12 = DIPLOMA/OTHER POSTSCHOOL COMPLETE
13 = FURTHER DEGREE COMPLETE
98 = DON'T KNOW

*** CODES FOR Q.14

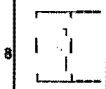
11 = ASSAULT IN HOME
12 = POLITICAL VIOLENCE
13 = OTHER ASSAULT OUTSIDE OF HOME
14 = SELF INFLICTED VIOLENCE
21 = TRAFFIC COLLISION
22 = ACCIDENT AT WORK
23 = SPORT
96 = OTHER UNINTENTIONAL

**** Q.15 THROUGH Q.18:

These questions refer to the biological parents of the child. Record 00 if parent not member of household.

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD*	RESIDENCE		SEX	AGE	GRANTS/ PENSION	EDUCATION			WORK	INJURIES IN THE LAST MONTH		PARENTAL SURVIVORSHIP AND RESIDENCE FOR PERSONS LESS THAN 15 YEARS OLD****				ELIGIBILITY	
											AGE 10+							CIRCLE LINE NUMBER OF	
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?	Does (NAME) usually live here?	Did (NAME) stay here last night?	Is (NAME) male or female?	How old is (NAME)? (WRITE 00 IF UNDER 1 YEAR). IF 95 OR OVER, WRITE '95'	Does (NAME) receive a child maintenance grant, a disability grant or a pension from the government?	Has (NAME) ever been to school?	IF ATTENDED SCHOOL: What is the highest level of school (NAME) completed?**	IF AGE LESS THAN 25 YEARS: Is (NAME) still in school?	Did (NAME) work for pay during the last 7 days?	Did (NAME) have any injury that was treated by a doctor or nurse during the last 30 days?	IF INJURED IN LAST 1 MONTH: What type of injury*** did (NAME) have?	Is (NAME)'s natural mother alive?	IF ALIVE: Does (NAME)'s natural mother live in this household? IF YES: What is her name? RECORD MOTHER'S LINE NUMBER	Is (NAME)'s natural father alive?	IF ALIVE: Does (NAME)'s natural father live in this household? IF YES: What is his name? RECORD FATHER'S LINE NUMBER	ALL PERSONS 15 YEARS OR OLDER	ALL WOMEN AGE 15-49
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
			YES NO	YES NO	M F	IN YEARS	YES NO DK	YES NO		YES NO	YES NO	YES NO DK		YES NO DK		YES NO DK			
01			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 8 GO TO (15)		1 2 8		1 2 8		01	01
02			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 8 GO TO (15)		1 2 8		1 2 8		02	02
03			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 8 GO TO (15)		1 2 8		1 2 8		03	03

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
04			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		04	04
05			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		05	05
06			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		06	06
07			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		07	07
08			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		08	08
09			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		09	09
10			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		10	10
11			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		11	11
12			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		12	12
13			1 2	1 2	1 2		1 2 8	1 2		1 2	1 2	1 2 GO TO (15)		1 2 8		1 2 8		13	13

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)

TICK HERE IF CONTINUATION SHEET USED ☐ → [ ]

Just to make sure that I have a complete listing:

1)	Are there any other persons such as small children or infants that we have not listed?	YES ☐ →	E
2)	In addition, are there any other people who may not be members of your family, such as domestic workers, lodgers or friends who usually live here?	YES ☐ →	E
3)	Are there any guests or temporary visitors staying here, or anyone else who slept here last night that have not been listed?	YES ☐ →	E

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
21	Has anyone in the household died in the last 12 months?	YES ..... 1 NO 2	→25
22	In the last 12 months, how many people in your household died?	NUMBER OF PERSONS ..... [ ][ ]	
23	In the last 12 months, how many people in your household died from an injury sustained as a result of violence either between them and other people or from violence inflicted upon themselves?	NUMBER OF PERSONS ..... [ ][ ]	
24	In the last 12 months, how many persons in your household died from an unintentional injury they sustained such as from a traffic collision, or an injury (such as falls, burns or cuts) that happended at home/work/school/etc?	NUMBER OF PERSONS ..... [ ][ ]	
25	What is the main source of drinking water for members of your household?	PIPED WATER (TAP) IN DWELLING ..... 11 PIPED WATER (TAP) IN SITE/YARD ..... 12 PUBLIC TAP ..... 13 WATER CARRIER/TANKER ..... 21 BOREHOLE/WELL ..... 31 DAM/RIVER/STREAM/SPRING ..... 32 RAIN-WATER TANK ..... 41 →28 BOTTLED WATER ..... 51 →28 OTHER _____ 98	→28
26	How long does it take you to get there, get water, and come back?	MINUTES ..... [ ][ ][ ] ON PREMISES 996	
27	Who fetched the water yesterday? RECORD ALL MENTIONED.	FEMALE ADULT ..... A MALE ADULT ..... B FEMALE CHILD ..... C MALE CHILD ..... D DON'T KNOW ..... Z	
28	What kind of toilet facility does your household have?	FLUSH TOILET (OWN) ..... 11 FLUSH TOILET (SHARED) ..... 12 BUCKET LATRINE ..... 21 PIT LATRINE ..... 22 NO FACILITY/BUSH/FIELD ..... 31 OTHER _____ 96	
29	Does your household have: Electricity? A radio? A television? A telephone? A refrigerator? A personal computer (PC)? A washing machine?	YES NO ELECTRICITY ..... 1 2 RADIO ..... 1 2 TELEVISION ..... 1 2 TELEPHONE ..... 1 2 REFRIGERATOR ..... 1 2 PERSONAL COMPUTER ..... 1 2 WASHING MACHINE 1 2	
30	What does your household use for cooking and heating? RECORD ALL MENTIONED.	ELECTRICITY ..... A GAS ..... B PARAFFIN ..... C WOOD ..... D COAL ..... E ANIMAL DUNG ..... F OTHER _____ X	
31	How many rooms in your household are used for sleeping?	ROOMS ..... [ ][ ]	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
32	MAIN MATERIAL OF THE FLOOR. RECORD OBSERVATION	EARTH/SAND/DUNG ..... 11 BARE WOOD PLANKS ..... 21 CEMENT ..... 31 VINYL ..... 32 CARPET ..... 33 CERAMIC TILES ..... 34 PARQUET OR POLISHED WOOD ..... 35 OTHER _____ 96	
33	MAIN MATERIAL IN THE WALLS. RECORD OBSERVATION	PLASTIC/CARDBOARD ..... 11 MUD ..... 12 MUD AND CEMENT ..... 13 CORRUGATED IRON/ZINC ..... 21 PREFAB ..... 22 BARE BRICK/CEMENT BLOCK ..... 23 PLASTER/FINISHED ..... 31 OTHER _____ 96	
34	Let us speak about the household and what it can afford. Would you say that the people here often, sometimes, seldom or never go hungry?	OFTEN ..... 1 SOMETIMES ..... 2 SELDOM ..... 3 NEVER 4	
35	Does any member of your household own: A bicycle? A motorcycle? A car? A donkey or a horse? Sheep or cattle?	YES NO BICYCLE ..... 1 2 MOTORCYCLE ..... 1 2 CAR ..... 1 2 DONKEY/HORSE ..... 1 2 SHEEP/CATTLE 1 2	

15/1/98

SOUTH AFRICAN DEMOGRAPHIC AND HEALTH SURVEY
WOMEN QUESTIONNAIRE

IDENTIFICATION

PROVINCE _____

DISTRICT _____

EA NUMBER .....

EA TYPE .....

SADHS CLUSTER NUMBER .....

HOUSEHOLD NUMBER .....

NAME AND LINE NUMBER OF WOMAN _____

NAME OF HOUSEHOLD HEAD _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR
INTERVIEWER'S NAME				NAME
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NO. OF VISITS
TIME				

*RESULT CODES:
1 COMPLETED
2 NOT AT HOME
3 POSTPONED
4 REFUSED
5 PARTLY COMPLETED
6 INCAPACITATED
7 OTHER _____ (SPECIFY)

LANGUAGE

LANGUAGE OF QUESTIONNAIRE .....

LANGUAGE OF INTERVIEW .....

HOME LANGUAGE OF RESPONDENT .....

TRANSLATOR USED (YES = 1, NO = 2) .....

LANGUAGE CODES

01 ENGLISH	04 isi ZULU	07 SePEDI	10 ZITSONGA
02 AFRIKAANS	05 SeSOTHO	08 SISWATI	11 isiNDEBELA
03 isiXHOSA	06 SeTSWANA	09 TshiVENDA	

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME _____	NAME _____		

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
DATE _____	DATE _____		

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	
102	First I would like to ask some questions about you and your household. For most of the time until you were 12 years old, did you live in a city, in a large town, on a farm or in rural areas?	CITY . . . . . 1 TOWN . . . . . 2 RURAL/FARM 3	
103	How long have you been living continuously in (NAME OF CURRENT PLACE OF RESIDENCE)? IF LESS THAN 1 YEAR, WRITE '00'	YEARS . . . . . [ ][ ] ALWAYS . . . . . 95 VISITOR . . . . . 96 → 105	
104	Just before you moved here, did you live in a city, in a town, or in the rural area /farm?	CITY . . . . . 1 TOWN . . . . . 2 RURAL/FARM 3	
105	In what month and year were you born?	MONTH . . . . . [ ][ ] DON'T KNOW MONTH . . . . . 98 YEAR . . . . . [ ][ ][ ][ ] DON'T KNOW YEAR 9998	
106	How old were you at your last birthday? COMPARE AND CORRECT 105 AND/OR 106 IF INCONSISTENT.	AGE IN COMPLETED YEARS [ ][ ]	
107	Have you ever attended school?	YES . . . . . 1 NO . . . . . 2 → 114	
109	What is the highest (standard/year) you completed ?	LESS THAN ONE YEAR COMPLETED 00 SUB A/CLASS 1 . . . . . 71 SUB B/CLASS 2 . . . . . 72 STANDARD 1 . . . . . 01 STANDARD 2 . . . . . 02 STANDARD 3 . . . . . 03 STANDARD 4 . . . . . 04 STANDARD 5 . . . . . 05 STANDARD 6 . . . . . 06 STANDARD 7 . . . . . 07 STANDARD 8 . . . . . 08 STANDARD 9 . . . . . 09 STANDARD 10 . . . . . 10 FURTHER STUDIES INCOMPLETE . 11 DIPLOMA/OTHER POSTSCHOOL COMPLETE . . . . . 12 FURTHER DEGREE COMPLETE . . 13	
110	CHECK 106: AGE 24 OR BELOW [ ] ▼ AGE 25 OR ABOVE [ ] → 114		
111	Are you currently attending school?	YES . . . . . 1 → 114 NO 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
112	What was the main reason you stopped attending school?	GOT PREGNANT ..... 01 GOT MARRIED ..... 02 TO CARE FOR YOUNGER CHILDREN ..... 03 FAMILY NEEDED HELP ON FARM OR IN BUSINESS ..... 04 COULD NOT PAY SCHOOL FEES .. 05 NEEDED TO EARN MONEY ..... 06 GRADUATED/HAD ENOUGH SCHOOLING ..... 07 DID NOT PASS ENTRANCE EXAMS 08 DID NOT LIKE SCHOOL ..... 09 SCHOOL NOT ACCESSIBLE/ TOO FAR ..... 10 OTHER _____ 96 (SPECIFY) DON'T KNOW 96	
114	Can you read and understand a letter or newspaper in your home language easily, with difficulty, or not at all?	EASILY ..... 1 WITH DIFFICULTY ..... 2 NOT AT ALL 3	→116
115	Have you read a newspaper or magazine in the last week?	YES ..... 1 NO 2	
116	Do you usually listen to a radio every day?	YES ..... 1 NO 2	
117	Do you usually watch television at least once a week?	YES ..... 1 NO 2	
119	Which race group do you consider yourself?	BLACK/AFRICAN ..... 1 COLOURED ..... 2 WHITE ..... 3 ASIAN/INDIAN 4	
120	CHECK Q.4 IN THE HOUSEHOLD QUESTIONNAIRE THE WOMAN INTERVIEWED IS NOT A USUAL RESIDENT ☐ ↓ THE WOMAN INTERVIEWED IS A USUAL RESIDENT ☐		→201
121	Now I would like to ask about the place in which you usually live. What is the name of the place in which you usually live? _____ (NAME OF PLACE) Is that a large city, town, or rural area /farm?	CITY ..... 1 TOWN ..... 2 RURAL/FARM 3	
122	In which PROVINCE is that located?	EASTERN CAPE ..... 01 FREE STATE ..... 02 GAUTENG ..... 03 KWAZULU/NATAL ..... 04 MPUMALANGA ..... 05 NORTHERN CAPE ..... 06 NORTHERN PROVINCE ..... 07 NORTH WEST ..... 08 WESTERN CAPE ..... 09 OTHER COUNTRY 10	
123	Now I would like to ask about the household in which you usually live. What is the main source of drinking water for members of your household?	PIPED WATER (tap), IN DWELLING 11 PIPED WATER (tap), IN SITE/YARD 12 PUBLIC TAP ..... 13 WATER CARRIER/ TANKER ..... 21 BOREHOLE/WELL ..... 31 DAM /RIVER/STREAM/SPRING .... 32 RAIN-WATER TANK ..... 41 BOTTLED WATER ..... 51 OTHER _____ 96 (SPECIFY)	
125	What kind of toilet facility does your household have?	FLUSH TOILET (OWN) ..... 11 FLUSH TOILET (SHARED) ..... 12 BUCKET LATRINE ..... 21 PIT LATRINE ..... 22 NO FACILITY/BUSH/FIELD ..... 31 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
126	Does your household have: Electricity? A radio? A television? A telephone? A refrigerator? A personal computer (PC)? A washing machine?	YES NO ELECTRICITY . . . . . 1 2 RADIO . . . . . 1 2 TELEVISION . . . . . 1 2 TELEPHONE . . . . . 1 2 REFRIGERATOR . . . . . 1 2 PERSONAL COMPUTER . . . 1 2 WASHING MACHINE 1 2	
127	Could you describe the main material of the walls of your home?	PLASTIC/CARDBOARD . . . . . 11 MUD . . . . . 12 MUD AND CEMENT . . . . . 13 CORRUGATED IRON/ZINC . . . . . 21 PREFAB . . . . . 22 BARE BRICK/CEMENT BLOCK . . . . 23 PLASTER/FINISHED . . . . . 31 OTHER _____ 96 (SPECIFY)	

SECTION 2. REPRODUCTION

	Now I would like to ask you about all the pregnancies that you have had in your lifetime. By this I mean all the children born to you, whether they were born alive or dead, whether still living or not, whether living with you or elsewhere, and all the pregnancies that you have had that did not result in a live birth. I understand that it is not easy to talk about children who have died, or pregnancies that have terminated before full term, but it is extremely important that you tell us about <u>all</u> of them, so that we can develop programs that will help the Government of South Africa improve children's health in the future.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES ..... 1 NO 2	——→206
202	Do you have any sons or daughters to whom you have given birth who are living with you?	YES ..... 1 NO 2	——→204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME ..... [ ][ ] DAUGHTERS AT HOME .. [ ][ ]	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES ..... 1 NO 2	——→206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE ..... [ ][ ] DAUGHTERS ELSEWHERE [ ][ ]	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried or showed signs of life but survived only a few hours or days?	YES ..... 1 NO 2	——→208
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD ..... [ ][ ] GIRLS DEAD ..... [ ][ ]	
208	Women sometimes have pregnancies that do not result in a live born child. That is, a pregnancy can end very early, in a miscarriage or an abortion or the child can be born dead. Have you had any such pregnancy that did not result in a live birth?	YES ..... 1 NO 2	——→210
209	In all, how many such pregnancies have there been?	PREGNANCY LOSSES ... [ ][ ]	
210	SUM ANSWERS TO 203, 205, 207 AND 209, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL ..... [ ][ ]	
212	CHECK 210: ONE OR MORE PREGNANCIES [ ] ▼ NO PREGNANCIES [ ]		——→234

213 Now I would like to ask you about all of your pregnancies, whether born alive, born dead, or lost before full term, starting with the first one you had.
RECORD ALL THE PREGNANCIES. RECORD TWINS AND TRIPLETS ON SEPARATE LINES.

214 Think back to the time of your (first/next) pregnancy.	215 Was that a single or multiple pregnancy?	216 Was the baby born alive, born dead, or lost before full term?	217 Did that baby cry, move, or breathe when it was born?	218 What was the name given to that child?	219 Is (NAME) a boy or a girl?	220 In what month and year was (NAME) born? PROBE: What is his/her birthday? OR: In what season was he/she born?	221 Is (NAME) still alive?
01	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224
02	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224
03	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224
04	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224
05	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224
06	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224
07	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224
08	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM 3 (SKIP TO 225)	YES . . 1 NO . . . 2 → 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR . 19	YES 1 NO . . 2 → 224

IF BORN ALIVE AND STILL LIVING:		IF BORN ALIVE BUT NOW DEAD:	IF BORN ALIVE BUT NOW DEAD:	IF BORN DEAD OR LOST BEFORE FULL TERM:			
222 How old was (NAME) at his/her last birthday? RECORD AGE IN COMPLETED YEARS.	223 Is (NAME) living with you?	224 How old was (NAME) when he/she died? IF '1 YR.', PROBE: How many months old was (NAME)? RECORD DAYS IF LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.	224A Did (NAME) die from diarrhoea?	225 In what year and month did this pregnancy end?	226 How many months did the pregnancy last? RECORD IN COMPLETED MONTHS.	228 FROM YEAR OF THIS PREGNANCY SUBTRACT YEAR OF PREVIOUS PREGNANCY. IS THE DIFFERENCE 2 OR MORE YEARS?	229 Were there any other pregnancies between the previous pregnancy mentioned and this pregnancy?
01 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (NEXT PREG.)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (NEXT PREG.)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ] (next preg.)		
02 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (GO TO 228)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (GO TO 228)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ]	YES . . . . . 1 NO . . . . . 2 (NEXT PREGNANCY)	YES . . . . 1 NO 2
03 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (GO TO 228)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (GO TO 228)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ]	YES . . . . . 1 NO . . . . . 2 (NEXT PREGNANCY)	YES . . . . 1 NO 2
04 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (GO TO 228)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (GO TO 228)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ]	YES . . . . . 1 NO . . . . . 2 (NEXT PREGNANCY)	YES . . . . 1 NO 2
05 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (GO TO 228)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (GO TO 228)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ]	YES . . . . . 1 NO . . . . . 2 (NEXT PREGNANCY)	YES . . . . 1 NO 2
06 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (GO TO 228)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (GO TO 228)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ]	YES . . . . . 1 NO . . . . . 2 (NEXT PREGNANCY)	YES . . . . 1 NO 2
07 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (GO TO 228)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (GO TO 228)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ]	YES . . . . . 1 NO . . . . . 2 (NEXT PREGNANCY)	YES . . . . 1 NO 2
08 AGE IN YEARS [ ][ ]	YES 1 NO . 2 (GO TO 228)	DAYS . . 1 MONTHS 2 YEARS . 3 [ ][ ]	YES . . . . 1 NO . . . . . 2 DK . . . . . 8 (GO TO 228)	MONTH [ ][ ] YEAR 19 [ ][ ]	MONTHS [ ][ ]	YES . . . . . 1 NO . . . . . 2 (NEXT PREGNANCY)	YES . . . . 1 NO 2

214 Think back to the time of your next pregnancy.	215 Was that a single or multiple pregnancy?	216 Was the baby born alive, born dead, or lost before full term?	217 Did that baby cry, move, or breathe when it was born?	218 What was the name given to that child?	219 Is (NAME) a boy or a girl?	220 In what month and year was (NAME) born? PROBE: What is his/her birthday? OR: In what season was he/she born?	221 Is (NAME) still alive?
09	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224
10	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224
11	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224
12	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224
13	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224
14	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224
15	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224
16	SINGLE . . . 1 MULTIPLE 2	BORN ALIVE . . . . . 1 (SKIP TO 218) BORN DEAD . . . . . 2 LOST BEFORE FULL TERM . . . . . 3 (SKIP TO 225)	YES . . 1 NO . . . 2 225	_____ (NAME)	BOY . 1 GIRL . 2	MONTH . . . YEAR 19	YES 1 NO . . 2 224

IF BORN ALIVE AND STILL LIVING:		IF BORN ALIVE BUT NOW DEAD:		IF BORN ALIVE BUT NOW DEAD:	IF BORN DEAD OR LOST BEFORE FULL TERM:			
222 How old was (NAME) at his/her last birthday? RECORD AGE IN COMPLETED YEARS.	223 Is (NAME) living with you?	224 How old was (NAME) when he/she died? IF '1 YR.', PROBE: How many months old was (NAME)? RECORD DAYS IF LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.		224A Did (NAME) die from diarrhoea	225 In what year and month did this pregnancy end?	228 How many months did the pregnancy last? RECORD IN COMPLETED MONTHS.	228 FROM YEAR OF THIS PREGNANCY SUBTRACT YEAR OF PREVIOUS PREGNANCY. IS THE DIFFERENCE 2 OR MORE?	229 Were there any other pregnancies between the previous pregnancy mentioned and this pregnancy?
09 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2
10 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2
11 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2
12 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2
13 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2
14 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2
15 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2
16 AGE IN YEARS [ ][ ]	YES 1 NO 2 (GO TO 228)	DAYS 1 MONTHS 2 YEARS 3	[ ][ ]	YES 1 NO 2 DK 8 (GO TO 228)	MONTH [ ][ ] YEAR 19[ ][ ]	MONTHS [ ][ ]	YES 1 NO 2 (NEXT PREGNANCY)	YES 1 NO 2

230	FROM YEAR OF INTERVIEW SUBTRACT YEAR OF LAST PREGNANCY. IS THE DIFFERENCE 2 YEARS OR MORE?	YES ..... 1 NO 2	 →232
231	Have you had any pregnancies since the last pregnancy mentioned?	YES ..... 1 NO 2	→214

232 COMPARE 210 WITH NUMBER OF PREGNANCIES IN HISTORY ABOVE AND MARK:

NUMBERS ARE SAME ☐ NUMBERS ARE DIFFERENT ☐→ (PROBE AND RECONCILE)

CHECK: FOR EACH PREGNANCY: YEAR IS RECORDED IN 220 OR 225. ☐☐

FOR EACH LIVING CHILD: CURRENT AGE IS RECORDED IN 222. ☐☐

FOR EACH DEAD CHILD: AGE AT DEATH IS RECORDED IN 224. ☐☐

FOR EACH PREGNANCY LOSS: DURATION IS RECORDED IN 226. ☐☐

FOR AGE AT DEATH 12 MONTHS OR 1 YR.: PROBE TO DETERMINE EXACT NUMBER OF MONTHS. ☐☐

233 CHECK 220 AND ENTER THE NUMBER OF BIRTHS SINCE JANUARY 1993.
IF NONE, RECORD '0'. ☐☐

234	Are you pregnant now?	YES ..... 1 NO ..... 2 UNSURE 8	 →237 →237
235	How many months pregnant are you?	MONTHS ☐☐	
236	At the time you became pregnant, did you want to become pregnant then, did you want to wait until later, or did you not want to have anymore children at all?	THEN ..... 1 LATER ..... 2 NOT WANT MORE CHILDREN 3	
237	When did your last menstrual period start? _____ (DATE, IF GIVEN)	DAYS AGO ..... 1 ☐☐ WEEKS AGO ..... 2 ☐☐ MONTHS AGO ..... 3 ☐☐ YEARS AGO ..... 4 ☐☐ IN MENOPAUSE ..... 994 BEFORE LAST BIRTH ..... 995 NEVER MENSTRUATED 996	

238	Do you have any of the following problems:		YES	NO
	Wet yourself when you cough, sneeze or lift heavy weights?	WET WHEN COUGH/SNEEZE ...	1	2
	Are you constantly wet?	CONSTANTLY WET	1	2
	Are you constantly soiled?	CONSTANTLY SOILED	1	2

SECTION 3. CONTRACEPTION

Now I would like to talk about family planning - the various ways or methods that a couple can use to delay or avoid a pregnancy.

CIRCLE CODE 1 IN 301 FOR EACH METHOD MENTIONED SPONTANEOUSLY.
THEN PROCEED DOWN COLUMN 302, READING THE NAME AND DESCRIPTION OF EACH METHOD NOT MENTIONED SPONTANEOUSLY. CIRCLE CODE 2 IF METHOD IS RECOGNIZED, AND CODE 3 IF NOT RECOGNIZED.
THEN, FOR EACH METHOD WITH CODE 1 OR 2 CIRCLED IN 301 OR 302, ASK 303.

301	Which ways or methods have you heard about?	302 Have you ever heard of (METHOD)? SPONTANEOUS YES	PROBED YES	NO	303 Have you ever used (METHOD)?
01	PILL Women can take a pill every day.	1	2	3	YES ..... 1 NO 2
02	IUD Women can have a loop or coil placed inside them by a doctor or a nurse.	1	2	3	YES ..... 1 NO 2
03	INJECTIONS Women can have an injection by a doctor or nurse which stops them from becoming pregnant for several months.	1	2	3	YES ..... 1 NO 2
04	DIAPHRAGM, FOAM, JELLY Women can place a sponge, suppository, diaphragm, jelly, or cream inside themselves before intercourse.	1	2	3	YES ..... 1 NO 2
05	CONDOM Men can put a rubber sheath on their penis during sexual intercourse.	1	2	3	YES ..... 1 NO 2
06	FEMALE STERILIZATION Tie the tubes. Women can have an operation to avoid having any more children.	1	2	3	Have you ever had an operation to avoid having any more children? YES ..... 1 NO 2
07	MALE STERILIZATION Men can have an operation to avoid having any more children.	1	2	3	Have you ever had a partner who had an operation to avoid having children? YES ..... 1 NO 2
08	RHYTHM, CALENDAR METHOD Every month that a woman is sexually active she can avoid having sexual intercourse on the days of the month she is most likely to get pregnant.	1	2	3	YES ..... 1 NO 2
09	WITHDRAWAL Men can be careful and pull out before climax.	1	2	3	YES ..... 1 NO 2
10	HERBS. Women use natural herbs or Dutch remedies to avoid pregnancy	1	2	3	YES ..... 1 NO 2
11	Have you heard of any other ways or methods that women or men can use to avoid pregnancy?	1		3	YES ..... 1 NO 2
		_____ (SPECIFY)			YES ..... 1 NO 2
		_____ (SPECIFY)			

304	CHECK 303:
	NOT A SINGLE "YES" ☐ (NEVER USED)
	AT LEAST ONE "YES" ☐ (EVER USED) → SKIP TO 306

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
305	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	YES ..... 1 NO 2	→331
307	What have you used or done? CORRECT 303 AND 304 (AND 302 IF NECESSARY).		
308	Now I would like to ask you about the first time that you did something or used a method to avoid getting pregnant. What was the first method you ever used?	PILL ..... 01 IUD ..... 02 INJECTIONS ..... 03 DIAPHRAGM/FOAM/JELLY ..... 04 CONDOM ..... 05 FEMALE STERILIZATION ..... 06 MALE STERILIZATION ..... 07 RHYTHM/ CALENDER METHOD ... 08 WITHDRAWAL ..... 09 HERB/REMEDIES ..... 10 OTHER _____ 96 (SPECIFY)	
309	How many living children did you have at that time, if any? IF NONE, RECORD '00'.	NUMBER OF CHILDREN .. [ ][ ]	
309A	How old were you when you first used something to avoid getting pregnant?	AGE ..... [ ][ ]	
309B	From whom did you first get information about methods to avoid pregnancy?	MOTHER ..... A SISTER ..... B FATHER ..... C OTHER RELATIVE ..... D FRIEND ..... E TEACHER ..... F NURSE ..... G DOCTOR ..... H POSTER/LEAFLET/MAGAZINE ..... I RADIO/TELEVISION ..... J OTHER _____ X (SPECIFY)	
309C	CHECK 309A: AGE LESS THAN 19 YEARS ☐ AGE 19 YEARS OR OLDER ☐		→311
309E	Did your parent(s) or guardian give advice on contraceptives or explain how to use them?	YES ..... 1 NO 2	
311	CHECK 303: WOMAN NOT STERILIZED ☐ WOMAN STERILIZED ☐		→314A
312	CHECK 234: NOT PREGNANT OR UNSURE ☐ PREGNANT ☐		→331
313	Are you currently doing something or using any method to delay or avoid getting pregnant?	YES ..... 1 NO 2	→331
314	Which method are you using?	PILL ..... 01 IUD ..... 02 INJECTIONS ..... 03 DIAPHRAGM/FOAM/JELLY ..... 04 CONDOM 05	→328
314A	CIRCLE '06' FOR FEMALE STERILIZATION.	FEMALE STERILIZATION ..... 06 MALE STERILIZATION ..... 07 RHYTHM, CALENDER METHOD ... 08 WITHDRAWAL ..... 09 HERB/REMEDIES ..... 10 OTHER _____ 96 (SPECIFY)	→323 →332

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
318	Where did the sterilization take place? IF SOURCE IS HOSPITAL, HEALTH CENTER, OR CLINIC, WRITE THE NAME OF THE PLACE. PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL .... 11 DAY HOSPITAL/CLINIC/ COMMUNITY HEALTH CENTRE 12 FAMILY PLANNING CLINIC .... 13 OTHER PUBLIC _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC ... 21 PRIVATE DOCTOR ..... 23 OTHER PRIVATE MEDICAL _____ 26 (SPECIFY) OTHER _____ 96 (SPECIFY) DON'T KNOW 98	
319	Do you regret that (you/your partner) had the operation not to have any (more) children?	YES ..... 1 NO 2	→321
320	Why do you regret the operation?	RESPONDENT WANTS ANOTHER CHILD ..... 01 PARTNER WANTS ANOTHER CHILD 02 SIDE EFFECTS ..... 03 CHILD DIED ..... 04 OTHER _____ 96 (SPECIFY)	
321	In what month and year was the sterilization performed?	MONTH ..... YEAR	→335
323	How do you determine which days of your monthly cycle not to have sexual relations?	BASED ON CALENDAR ..... 01 BASED ON BODY TEMPERATURE . 02 BASED ON CERVICAL MUCUS (BILLINGS METHOD) ..... 03 BASED ON BODY TEMPERATURE AND CERVICAL MUCUS ..... 04 NO SPECIFIC SYSTEM ..... 05 OTHER _____ 96 (SPECIFY)	→332
328	Where did you obtain (METHOD) the last time? IF SOURCE IS HOSPITAL, HEALTH CENTER, OR CLINIC, WRITE THE NAME OF THE PLACE. PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL .... 11 DAY HOSPITAL/CLINIC/ COMMUNITY HEALTH CENTER 12 FAMILY PLANNING CLINIC ... 13 MOBILE CLINIC ..... 14 COMMUNITY HEALTH WORKER 15 OTHER PUBLIC _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC .. 21 PHARMACY ..... 22 PRIVATE DOCTOR/ GYNECOLOGIST ..... 23 OTHER PRIVATE MEDICAL _____ 26 (SPECIFY) OTHER SOURCE SHOP ..... 31 CHURCH ..... 32 FRIEND/RELATIVE ..... 33 OTHER _____ 96 (SPECIFY)	→330A

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
330	Do you agree with the following statements about the family planning service you use? The staff shout and scold The staff do not explain much about the Family Planning method The staff ignore problems which you report The staff are unfriendly	AGREE DISAGREE 1 2 1 2 1 2 1 2	
330A	People select the place where they get family planning services for various reasons. What were the reasons you went to (NAME OF PLACE IN Q.328) instead of some other place you know about? RECORD ALL RESPONSES AND CIRCLE CODES. What is the Main Reason?	ACCESS-RELATED REASONS CLOSER TO HOME ..... A CLOSER TO MARKET/WORK .. B AVAILABILITY OF TRANSPORT C SERVICE-RELATED REASONS STAFF MORE COMPETENT/ FRIENDLY ..... D CLEANER FACILITY ..... E OFFERS MORE PRIVACY ..... F SHORTER WAITING TIME ..... G LONGER HRS. OF SERVICE ... H USE OTHER SERVICES AT THE FACILITY ..... I LOWER COST/CHEAPER ..... J WANTED ANONYMITY ..... K OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	
330B	Over the last 12 months have you had a break in your contraceptive use for any reason?	YES ..... 1 NO 2	——→335
330C	Over the last 12 months, why have you had a break in your contraceptive use?	WAS PREGNANT ..... 01 NO BOYFRIEND/ SEXUALLY INACTIVE ..... 02 WANTED TO SEE MENSTRUATION 03 HEALTH REASONS ..... 04 OTHER _____ . 96 (SPECIFY)	→335
331	What are the main reasons you are not using a method of contraception to avoid pregnancy? RECORD ALL MENTIONED What is the Main Reason?	NEVER HAD SEX ..... A FERTILITY-RELATED REASONS NOT HAVING SEX ..... B INFREQUENT SEX ..... C MENOPAUSAL/HYSTERECTOMY D INFERTILE ..... E POSTPARTUM/BREASTFEEDING F WANTS (MORE) CHILDREN .... G PREGNANT ..... H OPPOSITION TO USE RESPONDENT OPPOSED ..... I HUSBAND/PARTNER OPPOSED J OTHERS OPPOSED ..... K RELIGIOUS PROHIBITION ..... L LACK OF KNOWLEDGE KNOWS NO METHOD ..... M KNOWS NO SOURCE ..... N METHOD-RELATED REASONS HEALTH CONCERNS ..... O FEAR OF SIDE EFFECTS..... P LACK OF ACCESS/TOO FAR ... Q COST TOO MUCH ..... R INCONVENIENT TO USE ..... S INTERFERES WITH BODY'S NATURAL PROCESSES .. T OUT OF STOCK ..... U OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	
332	Do you know of a place where you can obtain a method of family planning?	YES ..... 1 NO 2	——→335

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
333	Where is that? IF SOURCE IS HOSPITAL, HEALTH CENTER, OR CLINIC, WRITE THE NAME OF THE PLACE. PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL .... 11 DAY HOSPITAL/CLINIC/ COMMUNITY HEALTH CENTER 12 FAMILY PLANNING CLINIC ... 13 MOBILE CLINIC ..... 14 COMMUNITY HEALTH WORKER 15 OTHER PUBLIC _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC .. 21 PHARMACY ..... 22 PRIVATE DOCTOR/ GYNECOLOGIST ..... 23 OTHER PRIVATE MEDICAL _____ 26 (SPECIFY) OTHER SOURCE SHOP ..... 31 CHURCH ..... 32 FRIEND/RELATIVE ..... 33 OTHER _____ 96 (SPECIFY)	
335	Have you visited any type of health facility for any reason in the last 12 months?	YES ..... 1 NO 2	—→337
336	Did any staff member at the health facility speak to you about family planning methods?	YES ..... 1 NO 2	
337	During which times of the monthly cycle does a woman have the greatest chance of becoming pregnant?	DURING HER PERIOD ..... 01 RIGHT AFTER HER PERIOD HAS ENDED ..... 02 IN THE MIDDLE OF THE CYCLE ... 03 JUST BEFORE HER PERIOD BEGINS 04 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	
338	I would like to ask you a question about the law on abortion in South Africa. Does the present law allow a woman in early pregnancy, which is up to 12 weeks, to have an abortion?	YES ..... 1 NO ..... 2 DON'T KNOW 8	

SECTION 4A. PREGNANCY AND CHILD HEALTH

401	CHECK 233: ONE OR MORE BIRTHS SINCE JAN. 1993 ☐	NO BIRTHS SINCE JAN. 1993 ☐ → (SKIP TO 465)	
402	ENTER THE NAME, LINE NUMBER, AND SURVIVAL STATUS OF EACH BIRTH SINCE JANUARY 1993 IN THE TABLE. ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE LAST BIRTH. (IF THERE ARE MORE THAN 2 BIRTHS, USE ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about your pregnancies and the health of all your children born in the last five years. (We will talk about one child at a time.)		
403	LINE NUMBER FROM Q214	LAST BIRTH LINE NUMBER .... ☐☐	NEXT-TO-LAST BIRTH LINE NUMBER .... ☐☐
404	FROM Q218 AND Q221	NAME _____ ALIVE ☐ DEAD ☐	NAME _____ ALIVE ☐ DEAD ☐
405	At the time you became pregnant with (NAME), did you want to become pregnant then, did you want to wait until later, or did you want no (more) children at all?	THEN ..... 1 (SKIP TO 407) LATER ..... 2 NO MORE ..... 3 (SKIP TO 407)	THEN ..... 1 (SKIP TO 407) LATER ..... 2 NO MORE ..... 3 (SKIP TO 407)
406	How much longer would you like to have waited?	MONTHS ..... 1 ☐☐ YEARS ..... 2 ☐☐ DON'T KNOW 998	MONTHS ..... 1 ☐☐ YEARS ..... 2 ☐☐ DON'T KNOW 998
407	When you were pregnant with (NAME), did you go for antenatal care for this pregnancy? IF YES: Whom did you see? Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS SEEN.	HEALTH PROFESSIONAL DOCTOR ..... A NURSE/MIDWIFE ..... B OTHER PERSON TRADITIONAL BIRTH ATTENDANT ..... D OTHER _____ (SPECIFY) X NO ONE ..... Y (SKIP TO 410)	HEALTH PROFESSIONAL DOCTOR ..... A NURSE/MIDWIFE ..... B OTHER PERSON TRADITIONAL BIRTH ATTENDANT ..... D OTHER _____ (SPECIFY) X NO ONE ..... Y (SKIP TO 410)
407A	Where did you go the majority of times? PROBE FOR THE ONE PLACE VISITED MOST OFTEN	PUBLIC HOSPITAL ..... 01 PRIVATE HOSPITAL ..... 02 PUBLIC CLINIC ..... 03 PRIVATE CLINIC/SURGERY 04 PRIVATE MIDWIFE'S OFFICE 05 OTHER _____ (SPECIFY) 96	PUBLIC HOSPITAL ..... 01 PRIVATE HOSPITAL ..... 02 PUBLIC CLINIC ..... 03 PRIVATE CLINIC/SURGERY 04 PRIVATE MIDWIFE'S OFFICE 05 OTHER _____ (SPECIFY) 96
408	How many months pregnant were you when you first received antenatal care?	MONTHS ..... ☐☐ DON'T KNOW 98	MONTHS ..... ☐☐ DON'T KNOW 98
409	How many times did you receive antenatal care during this pregnancy?	NO. OF TIMES .... ☐☐ DON'T KNOW 98	NO. OF TIMES .... ☐☐ DON'T KNOW 98
410	When you were pregnant with (NAME) were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES ..... 1 NO ..... 2 DON'T KNOW 8

412	Where did you give birth to (NAME)? NAME OF PLACE	HOME ..... 11 PUBLIC SECTOR GOVT. HOSPITAL ..... 21 DAY HOSP/CLINIC COMMUNITY HEALTH CENTER ..... 22 GOVT. MOU ..... 23 OTHER PUBLIC _____ 26 (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC .. 31 OTHER PRIVATE MEDICAL _____ 36 (SPECIFY) OTHER _____ 96 (SPECIFY)	HOME ..... 11 PUBLIC SECTOR GOVT. HOSPITAL ..... 21 DAY HOSP/CLINIC/ COMMUNITY HEALTH CENTER ..... 22 GOVT. MOU ..... 23 OTHER PUBLIC _____ 26 (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC ... 31 OTHER PRIVATE MEDICAL _____ 36 (SPECIFY) OTHER _____ 96 (SPECIFY)
413	Who assisted with the delivery of (NAME)? Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS ASSISTING.	HEALTH PROFESSIONAL DOCTOR ..... A NURSE/MIDWIFE ..... B OTHER PERSON TRADITIONAL BIRTH ATTENDANT ..... D RELATIVE/FRIEND ..... E OTHER _____ X (SPECIFY) NO ONE ..... Y	HEALTH PROFESSIONAL DOCTOR ..... A NURSE/MIDWIFE ..... B OTHER PERSON TRADITIONAL BIRTH ATTENDANT ..... D RELATIVE/FRIEND ..... E OTHER _____ X (SPECIFY) NO ONE ..... Y
415	Was (NAME) delivered by caesarian section?	YES ..... 1 NO 2	YES ..... 1 NO 2
417	Was (NAME) weighed at birth?	YES ..... 1 NO ..... 2 (SKIP TO 419)	YES ..... 1 NO ..... 2 (SKIP TO 420)
418	How much did (NAME) weigh? RECORD WEIGHT FROM HEALTH CARD, IF AVAILABLE.	GRAMS FROM CARD .. 1 ____ GRAMS FROM RECALL 2 ____ DON'T KNOW 99998	GRAMS FROM CARD .. 1 ____ GRAMS FROM RECALL 2 ____ DON'T KNOW 99998
419	Has your period returned since the birth of (NAME)?	YES ..... 1 (SKIP TO 421) NO ..... 2 (SKIP TO 422)	
420	Did your period return between the birth of (NAME) and your next pregnancy?		YES ..... 1 NO ..... 2 (SKIP TO 424)
421	For how many months after the birth of (NAME) did you not have a period?	MONTHS ..... ____ DON'T KNOW 98	MONTHS ..... ____ DON'T KNOW 98
422	CHECK 234: RESPONDENT PREGNANT?	NOT PREG-NANT ☐ PREGNANT OR UNSURE ☐ (SKIP TO 424)	
423	Have you resumed sexual relations since the birth of (NAME)?	YES ..... 1 NO ..... 2 (SKIP TO 425)	
424	For how many months after the birth of (NAME) did you not have sexual relations?	MONTHS ..... ____ DON'T KNOW 98	MONTHS ..... ____ DON'T KNOW 98
425	Did you ever breastfeed (NAME)?	YES ..... 1 NO ..... 2 (SKIP TO 431)	YES ..... 1 NO ..... 2 (SKIP TO 431)

426	How long after birth did you first put (NAME) to the breast? IF LESS THAN 1 HOUR, RECORD '00' HOURS. IF LESS THAN 24 HOURS, RECORD HOURS. OTHERWISE, RECORD DAYS.	IMMEDIATELY . . . . . 000 HOURS . . . . . 1 ▒▒ DAYS . . . . . 2 ▒▒	IMMEDIATELY . . . . . 000 HOURS . . . . . 1 ▒▒ DAYS . . . . . 2 ▒▒
427	CHECK 404: CHILD ALIVE?	ALIVE ☐ DEAD ☐ (SKIP TO 429)	ALIVE ☐ DEAD ☐ (SKIP TO 429)
428	Are you still breastfeeding (NAME)?	YES . . . . . 1 (SKIP TO 432) NO 2	YES . . . . . 1 (SKIP TO 432) NO 2
429	For how many months did you breastfeed (NAME)?	MONTHS . . . . . ▒▒ DON'T KNOW 98	MONTHS . . . . . ▒▒ DON'T KNOW 98
430	Why did you stop breastfeeding (NAME)?	MOTHER ILL/WEAK . . . . . 01 CHILD ILL/WEAK . . . . . 02 CHILD DIED . . . . . 03 NIPPLE/BREAST PROBLEM . 04 NOT ENOUGH MILK . . . . . 05 MOTHER WORKING . . . . . 06 CHILD REFUSED . . . . . 07 WEANING AGE/AGE TO STOP . . . . . 08 BECAME PREGNANT . . . . . 09 STARTED USING CONTRACEPTION . . . . . 10 OTHER_____ 96 (SPECIFY)	MOTHER ILL/WEAK . . . . . 01 CHILD ILL/WEAK . . . . . 02 CHILD DIED . . . . . 03 NIPPLE/BREAST PROBLEM . 04 NOT ENOUGH MILK . . . . . 05 MOTHER WORKING . . . . . 06 CHILD REFUSED . . . . . 07 WEANING AGE/AGE TO STOP . . . . . 08 BECAME PREGNANT . . . . . 09 STARTED USING CONTRACEPTION . . . . . 10 OTHER_____ 96 (SPECIFY)
431	CHECK 404: CHILD ALIVE?	ALIVE ☐ DEAD ☐ (SKIP TO 434) (GO BACK TO 405 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 440)	ALIVE ☐ DEAD ☐ (SKIP TO 434) (GO BACK TO 405 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 440)
432	How many times did you breastfeed last night between sunset and sunrise? IF ANSWER IS NOT NUMERIC, PROBE FOR APPROXIMATE NUMBER	NUMBER OF NIGHTTIME FEEDINGS . . . . . ▒▒	NUMBER OF NIGHTTIME FEEDINGS . . . . . ▒▒
433	How many times did you breastfeed yesterday during the daylight hours? IF ANSWER IS NOT NUMERIC PROBE FOR APPROXIMATE NUMBER.	NUMBER OF DAYLIGHT FEEDINGS . . . . . ▒▒	NUMBER OF DAYLIGHT FEEDINGS . . . . . ▒▒
434	Did (NAME) drink anything from a bottle with a nipple yesterday or last night?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8

435	At any time yesterday or last night, was (NAME) given any of the following: Plain water? Sugar water/Juice Herbal tea/Rooibos? Baby formula? Any kind of milk? Any other liquid? Any food made from [MAIZE or RICE or WHEAT], such as PORRIDGE or BREAD Eggs, fish or poultry? Meat? Fruits or vegetables? Any other solid or semi-solid foods?	YES NO DK PLAIN WATER . . . . . 1 2 8 SUGAR WATER/JUICE 1 2 8 HERBAL/ROOIBOS TEA 1 2 8 BABY FORMULA . . . . 1 2 8 ANY KIND OF MILK . . 1 2 8 OTHER LIQUIDS . . . . 1 2 8 FOOD MADE FROM MAIZE/RICE/WHEAT 1 2 8 EGGS/FISH/POULTRY 1 2 8 MEAT . . . . . 1 2 8 FRUITS OR VEG. . . . 1 2 8 OTHER SOLID/ SEMI-SOLID FOODS . 1 2 8	YES NO DK PLAIN WATER . . . . . 1 2 8 SUGAR WATER/JUICE 1 2 8 HERBAL/ROOIBOS TEA 1 2 8 BABY FORMULA . . . . 1 2 8 ANY KIND OF MILK . . 1 2 8 OTHER LIQUIDS . . . . 1 2 8 FOOD MADE FROM MAIZE/RICE/WHEAT 1 2 8 EGGS/FISH/POULTRY 1 2 8 MEAT . . . . . 1 2 8 FRUITS OR VEG. . . . 1 2 8 OTHER SOLID/ SEMI-SOLID FOODS . 1 2 8
438	CHECK 435: FOOD OR LIQUID GIVEN YESTERDAY?	"YES" TO ONE MORE "NO/DK" TO ALL (SKIP TO 439)	"YES" TO ONE MORE "NO/DK" TO ALL (SKIP TO 439)
437	(Aside from breast-feeding,) how many times did (NAME) eat yesterday, including both meals and snacks? IF 7 OR MORE TIMES, RECORD '7'.	NUMBER OF TIMES . . . . DON'T KNOW 8	NUMBER OF TIMES . . . . DON'T KNOW 8
439		GO BACK TO 405 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 440.	GO BACK TO 405 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 440.

SECTION 4B: IMMUNIZATION AND HEALTH

440	ENTER THE NAME, LINE NUMBER, AND SURVIVAL STATUS OF EACH BIRTH SINCE JANUARY 1993 IN THE TABLE. ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE LAST BIRTH. (IF THERE ARE MORE THAN 2 BIRTHS, USE ADDITIONAL QUESTIONNAIRES).		
441	LINE NUMBER FROM Q214	LAST BIRTH LINE NUMBER	NEXT-TO-LAST BIRTH LINE NUMBER ....
442	FROM Q218 AND Q221	NAME _____ ALIVE ☐ DEAD ☐ (GO TO 442 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 485.)	NAME _____ ALIVE ☐ DEAD ☐ (GO TO 442 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 485.)
443	Do you have a card where (NAME'S) vaccinations are written down? IF YES: May I see it please?	YES, SEEN ..... 1 (SKIP TO 445) YES, NOT SEEN ..... 2 (SKIP TO 447) NO CARD 3	YES, SEEN ..... 1 (SKIP TO 445) YES, NOT SEEN ..... 2 (SKIP TO 447) NO CARD 3
444	Did you ever have a vaccination card for (NAME)?	YES ..... 1 (SKIP TO 447) NO 2	YES ..... 1 (SKIP TO 447) NO 2
445	(1) COPY VACCINATION DATE FOR EACH VACCINE FROM THE CARD (2) WRITE '44' IN 'DAY' COLUMN IF CARD SHOWS THAT A VACCINATION WAS GIVEN, BUT NO DATE IS RECORDED BCG Polio 0 (at birth) Polio 1 Polio 2 Polio 3 DPT 1 DPT 2 DPT 3 Hep. B 1 Hep. B 2 Hep. B 3 Measles	DAY MO YR BCG ☐☐ ☐☐ 19☐☐ P0 ☐☐ ☐☐ 19☐☐ P1 ☐☐ ☐☐ 19☐☐ P2 ☐☐ ☐☐ 19☐☐ P3 ☐☐ ☐☐ 19☐☐ D1 ☐☐ ☐☐ 19☐☐ D2 ☐☐ ☐☐ 19☐☐ D3 ☐☐ ☐☐ 19☐☐ H1 ☐☐ ☐☐ 19☐☐ H2 ☐☐ ☐☐ 19☐☐ H3 ☐☐ ☐☐ 19☐☐ Meas ☐☐ ☐☐ 19☐☐	DAY MO YR BCG ☐☐ ☐☐ 19☐☐ P0 ☐☐ ☐☐ 19☐☐ P1 ☐☐ ☐☐ 19☐☐ P2 ☐☐ ☐☐ 19☐☐ P3 ☐☐ ☐☐ 19☐☐ D1 ☐☐ ☐☐ 19☐☐ D2 ☐☐ ☐☐ 19☐☐ D3 ☐☐ ☐☐ 19☐☐ H1 ☐☐ ☐☐ 19☐☐ H2 ☐☐ ☐☐ 19☐☐ H3 ☐☐ ☐☐ 19☐☐ Meas ☐☐ ☐☐ 19☐☐
446	Did (NAME) receive any vaccinations that are not recorded on this card? RECORD 'YES' ONLY IF RESPONDENT MENTIONES BCG, POLIO 0-3, DPT 1-3, AND/OR MEASLES VACCINE(S).	YES 1 (PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 445) NO ..... 2 DON'T KNOW ..... 8 (SKIP TO 450)	YES 1 (PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 445) NO ..... 2 DON'T KNOW ..... 8 (SKIP TO 450)
447	Did (NAME) ever receive any vaccinations to prevent him/her from getting diseases?	YES ..... 1 NO ..... 2 (SKIP TO 450) DON'T KNOW 8	YES ..... 1 NO ..... 2 (SKIP TO 450) DON'T KNOW 8

448	Please tell me if (NAME) received any of the following vaccinations:		
448A	A BCG vaccination against tuberculosis, that is, an injection in the left arm or shoulder that caused a scar?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES ..... 1 NO ..... 2 DON'T KNOW 8
448B	Polio vaccine, that is, drops in the mouth?	YES ..... 1 NO ..... 2 (SKIP TO 448E) DON'T KNOW 8	YES ..... 1 NO ..... 2 (SKIP TO 448E) DON'T KNOW 8
448C	How many times?	NUMBER OF TIMES ..... [ ] DON'T KNOW 8	NUMBER OF TIMES ..... [ ] DON'T KNOW 8
448D	When was the first polio vaccine given, just after birth or later?	JUST AFTER BIRTH ..... 1 LATER 2	JUST AFTER BIRTH ..... 1 LATER 2
448E	DPT vaccination, that is, an injection usually given at the same time as polio drops?	YES ..... 1 NO ..... 2 (SKIP TO 448G) DON'T KNOW 8	YES ..... 1 NO ..... 2 (SKIP TO 448G) DON'T KNOW 8
448F	How many times?	NUMBER OF TIMES ..... [ ] DON'T KNOW 8	NUMBER OF TIMES ..... [ ] DON'T KNOW 8
448G	An injection to prevent measles?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES ..... 1 NO ..... 2 DON'T KNOW 8
448H	An injection to prevent hepatitis B?	YES ..... 1 NO ..... 2 (SKIP TO 450) DON'T KNOW 8	YES ..... 1 NO ..... 2 (SKIP TO 450) DON'T KNOW 8
448I	How meny times?	NUMBER OF TIMES ..... [ ] DON'T KNOW 8	NUMBER OF TIMES ..... [ ] DON'T KNOW 8
450	Has (NAME) been ill or feverish with e cough et any time in the last 2 weeks?	YES ..... 1 NO ..... 2 (SKIP TO 454) DON'T KNOW 8	YES ..... 1 NO ..... 2 (SKIP TO 454) DON'T KNOW 8
451	When (NAME) was ill with a cough, did he/she breathe with difficulty or faster than usual with short, fast breaths?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES ..... 1 NO ..... 2 DON'T KNOW 8
452	Did you seek advice or treatment for the illness?	YES ..... 1 NO ..... 2 (SKIP TO 454)	YES ..... 1 NO ..... 2 (SKIP TO 454)
453	Where did you seek advice or treatment? Anywhere else? RECORD ALL MENTIONED. _____ NAME OF PLACE	PUBLIC SECTOR GOVT. HOSPITAL ..... A DAY HOSP/CLINIC/ COMMUNITY HEALTH CENTER ..... B MOBILE CLINIC ..... D COMM. HEALTH WORKER .. E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC ... G PHARMACY ..... H PRIVATE DOCTOR ..... I OTHER PRIVATE MEDICAL _____ J (SPECIFY) OTHER SOURCE SHOP ..... K TRAD. HEALER ..... L OTHER _____ X (SPECIFY)	PUBLIC SECTOR GOVT. HOSPITAL ..... A DAY HOSP/CLINIC/ COMMUNITY HEALTH CENTER ..... B MOBILE CLINIC ..... D COMM. HEALTH WORKER . E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC ... G PHARMACY ..... H PRIVATE DOCTOR ..... I OTHER PRIVATE MEDICAL _____ J (SPECIFY) OTHER SOURCE SHOP ..... K TRAD. HEALER ..... L OTHER _____ X (SPECIFY)

454	Has (NAME) had diarrhoea in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 464) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 464) DON'T KNOW 8
455	Was there any blood in the stools?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
456	On the worst day of the diarrhoea, how many bowel movements did (NAME) have?	NUMBER OF BOWEL MOVEMENTS . . . . . [ ][ ] DON'T KNOW 98	NUMBER OF BOWEL MOVEMENTS . . . . . [ ][ ] DON'T KNOW 98
457	Was he/she given the same amount to drink as before the diarrhoea, or more, or less?	SAME . . . . . 1 MORE . . . . . 2 LESS . . . . . 3 DON'T KNOW 8	SAME . . . . . 1 MORE . . . . . 2 LESS . . . . . 3 DON'T KNOW 8
458	Was he/she given the same amount of food to eat as before the diarrhoea, or more, or less?	SAME . . . . . 1 MORE . . . . . 2 LESS . . . . . 3 DON'T KNOW 8	SAME . . . . . 1 MORE . . . . . 2 LESS . . . . . 3 DON'T KNOW 8
459	When (NAME) had diarrhoea, was he/she given any of the following to drink: A fluid, made from a special rehydration packet? Thin watery porridge? Soup? Home-made sugar-salt-water solution? Milk or infant formula? Yoghurt-based drink? Black Tea? Water? Coke? Any other liquid?	YES NO DK FLUID FROM ORS PKT 1 2 8 THIN WATERY PORRIDGE . . . . . 1 2 8 SOUP . . . . . 1 2 8 SUG.-SALT-WAT. SOL. 1 2 8 MILK/INFANT FORM. . . 1 2 8 YOGHURT-BASED DR. 1 2 8 BLACK TEA . . . . . 1 2 8 WATER . . . . . 1 2 8 COKE . . . . . 1 2 8 OTHER LIQUID 1 2 8	YES NO DK FLUID FROM ORS PKT 1 2 8 THIN WATERY PORRIDGE . . . . . 1 2 8 SOUP . . . . . 1 2 8 SUG.-SALT-WAT. SOL. 1 2 8 MILK/INFANT FORM. . . 1 2 8 YOGHURT-BASED DR. 1 2 8 BLACK TEA . . . . . 1 2 8 WATER . . . . . 1 2 8 COKE . . . . . 1 2 8 OTHER LIQUID 1 2 8
460	Was anything (else) given to treat the diarrhoea?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 462) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 482) DON'T KNOW 8
461	What was given to treat tha diarrhoea? Anything else? RECORD ALL MENTIONED.	HOMEMADE SUGAR-SALT-WATER SOLUTION . . . . . A PILL OR SYRUP . . . . . B INJECTION . . . . . C (I.V.) INTRAVENOUS . . . . . D HOME REMEDIES/ HERBAL MEDICINES . . . . E OTHER _____ X (SPECIFY)	HOMEMADE SUGAR-SALT-WATER SOLUTION . . . . A PILL OR SYRUP . . . . . B INJECTION . . . . . C (I.V.) INTRAVENOUS . . . . . D HOME REMEDIES/ HERBAL MEDICINES . . . E OTHER _____ X (SPECIFY)
462	Did you seek advice or treatment for the diarrhoea?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 464)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 464)

463	Where did you seek advice or treatment? Anywhere else? RECORD ALL MENTIONED.	PUBLIC SECTOR GOVT. HOSPITAL ..... A DAY HOSP/CLINIC/ COMMUNITY HEALTH CENTER ..... B MOBILE CLINIC ..... D COMM. HEALTH WORKER .. E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC ... G PHARMACY ..... H PRIVATE DOCTOR ..... I OTHER PRIVATE MEDICAL _____ J (SPECIFY) OTHER SOURCE SHOP ..... K TRAD. HEALER ..... L OTHER _____ X (SPECIFY)	PUBLIC SECTOR GOVT. HOSPITAL ..... A DAY HOSP/CLINIC/ COMMUNITY HEALTH CENTER ..... B MOBILE CLINIC ..... D COMM. HEALTH WORKER . E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC ... G PHARMACY ..... H PRIVATE DOCTOR ..... I OTHER PRIVATE MEDICAL _____ J (SPECIFY) OTHER SOURCE SHOP ..... K TRAD. HEALER ..... L OTHER _____ X (SPECIFY)
464		GO BACK TO 442 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 465.	GO BACK TO 442 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 465.

465	Now I am going to ask you some general questions about caring for children with diarrhoea and cough. When a child has diarrhoea, should he/she be given less to drink than usual, about the same amount, or more than usual?	LESS TO DRINK ..... 1 ABOUT SAME AMOUNT TO DRINK . 2 MORE TO DRINK ..... 3 DON'T KNOW 8	
466	When a child has diarrhoea, should he/she be given less to eat than usual, about the same amount, or more than usual?	LESS TO EAT ..... 1 ABOUT SAME AMOUNT TO EAT ... 2 MORE TO EAT ..... 3 DON'T KNOW 8	
467	When a child is sick with diarrhoea, what signs of illness would tell you that he or she should be taken to a health facility or health worker? RECORD ALL MENTIONED. DO NOT PROBE	REPEATED WATERY STOOLS ..... A ANY WATERY STOOLS ..... B REPEATED VOMITING ..... C ANY VOMITING ..... D BLOOD IN STOOLS ..... E FEVER ..... F MARKED THIRST ..... G NOT EATING/NOT DRINKING WELL . H GETTING SICKER/VERY SICK ..... I NOT GETTING BETTER ..... J SUNKEN FONTANELLE ..... K OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	
468	CHECK 459, ALL COLUMNS: NO CHILD RECEIVED ORS ☐ ANY CHILD RECEIVED ORS ☐		→470
469	Have you ever heard of a special product called ORSOL OR SOROL that you can get for the treatment of diarrhoea?	YES ..... 1 NO 2	
470	When a child is sick with a cough, what signs of illness would tell you that he or she should be taken to a health facility or health worker? RECORD ALL MENTIONED.	FAST BREATHING ..... A DIFFICULT BREATHING ..... B NOISY BREATHING ..... C FEVER/HIGH TEMPERATURE ..... D UNABLE TO DRINK ..... E NOT EATING/NOT DRINKING WELL . F GETTING SICKER/VERY SICK ..... G NOT GETTING BETTER ..... H COUGHING A LOT ..... I OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	

SECTION 5. MARITAL AND SEXUAL RELATIONS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
501	PRESENCE OF OTHERS AT THIS POINT.	YES NO CHILDREN UNDER 10 ..... 1 2 HUSBAND/PARTNER ..... 1 2 OTHER MALES ..... 1 2 OTHER FEMALES 1 2	
	Now I am going to ask you some sensitive questions about your marital and sexual relations. All information you give me is completely confidential.		
502	Are you currently married or living with a man?	YES, CURRENTLY MARRIED ..... 1 YES, LIVING WITH A MAN ..... 2 NO, NOT IN UNION 3	→507
503	Do you currently have a regular sexual partner, an occasional sexual partner, or no sexual partner at all?	REGULAR SEXUAL PARTNER ..... 1 TWO OR MORE REGULAR PARTNERS ... 2 OCCASIONAL SEXUAL PARTNER ..... 3 NO SEXUAL PARTNER 4	
504	Have you ever been married or lived with a man?	YES, FORMERLY MARRIED ..... 1 YES, LIVED WITH A MAN ..... 2 NO 3	→511 →514
506	What is your marital status now: are you widowed, divorced, or separated?	WIDOWED ..... 1 DIVORCED ..... 2 SEPARATED 3	→511
507	Is your husband/partner living with you now or is he staying elsewhere?	LIVING WITH HER ..... 1 STAYING ELSEWHERE 2	
508	Does your husband have any other wives besides yourself?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→511
509	How many other wives does he have?	NUMBER OF OTHER WIVES .... [ ][ ] DON'T KNOW ..... .98	
511	Have you been married or lived with a man only once, or more than once?	ONCE ..... 1 MORE THAN ONCE 2	
512	CHECK 511: MARRIED/LIVED WITH A MAN ONLY ONCE ☐ In what month and year did you start living with your husband/partner? MARRIED/LIVED WITH A MAN MORE THAN ONCE ☐ Now we will talk about your first husband/partner. In what month and year did you start living with him?	MONTH ..... [ ][ ] DON'T KNOW MONTH ..... 98 YEAR ..... [ ][ ][ ][ ] DON'T KNOW YEAR 9998	→514
513	How old were you when you started living with him?	AGE ..... [ ][ ]	
514	How old were you when you had your first period?	AGE ..... [ ][ ]	
515	Now I need to ask you some questions about sexual activity in order to gain a better understanding of some health and family planning issues. When was the last time you had sexual intercourse (if ever)?	NEVER ..... 000 DAYS AGO ..... 1 [ ][ ] WEEKS AGO ..... 2 [ ][ ] MONTHS AGO ..... 3 [ ][ ] YEARS AGO ..... 4 [ ][ ] BEFORE LAST BIRTH 996	→608 →517

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
515A	Can you describe your relationship with the person you last had sexual intercourse with?	MARITAL PARTNER ..... 01 OTHER REGULAR PARTNER ..... 02 CASUAL ACQUAINTANCE ..... 03 SOMEONE JUST MET ..... 04 COMMERCIAL SEX WORKER ..... 05 OTHER _____ (SPECIFY) 96	
516	CHECK 301 AND 302: KNOWS CONDOM ☐ → The last time you had sex, was a condom used? DOES NOT KNOW CONDOM ☐ → Some men use a condom, which means that they put a rubber sheath on their penis during sexual intercourse. The last time you had sex, was a condom used?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→516B →516B
516A	If not, what are the reasons why you didn't use one? RECORD ALL MENTIONED What is the Main Reason?	WANTS CHILDREN ..... A PERCEIVED LOW OR NO RISK OF STD/HIV ..... B RESPONDENT DISLIKE ..... C PARTNER DISLIKE ..... D CULTURAL/RELIGIOUS PROHIBITION ..... E DID NOT KNOW CONDOMS ..... F DID NOT KNOW HOW TO USE CONDOM ..... G BAD PREVIOUS EXPERIENCE WITH CONDOM ..... H INCONVENIENT TO USE ..... I LACK OF SPONTANEITY ..... J DID NOT KNOW SOURCE OF CONDOMS ..... K EMBARRASSED TO GET ..... L INCONVENIENT TO GET ..... M DIDN'T HAVE A CONDOM ..... N COST TOO MUCH ..... O NO/LESS SENSATION WITH CONDOM ..... P SUGGESTS LACK OF TRUST OF PARTNER ..... Q SUGGESTS LACK OF LOVE OF PARTNER ..... R FEAR OF LOSING IT INSIDE ..... S WASTES SPERM ..... T RUBBER SMELL ..... U PARTNER OR SELF HAS BURNING/ DISCOMFORT WHEN USING CONDOM ..... V PREFER SEX 'FLESH TO FLESH' ..... W CONDOM USE NOT COOL/MANLY/ TRENDY ..... Y OTHER _____ (SPECIFY) X DON'T KNOW ..... Z ▒	
516B	In the last 12 months, with how many different men have you had sexual intercourse?	NUMBER ..... ▒▒	
517	Do you know of a place where you can get condoms?	YES ..... 1 NO 2	→51 9

518	Where is that? IF SOURCE IS HOSPITAL, HEALTH CENTER, OR CLINIC, WRITE THE NAME OF THE PLACE. PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . 11 DAY HOSP/CLINIC COMMUNITY HEALTH CENTER . . . . 12 FAMILY PLANNING CLINIC . . . . . 13 MOBILE CLINIC . . . . . 14 COMMUNITY HEALTH WORKER . . 15 OTHER PUBLIC . . . . . 16 _____ (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PHARMACY . . . . . 22 PRIVATE DOCTOR . . . . . 23 OTHER PRIVATE MEDICAL . . . . . 26 _____ (SPECIFY) OTHER SOURCE SHOP . . . . . 31 CHURCH . . . . . 32 FRIENDS/RELATIVES . . . . . 33 OTHER_____ 36 (SPECIFY)	
519	How old were you when you first had sexual intercourse?	AGE . . . . . [ ][ ] FIRST TIME WHEN MARRIED 96	

SECTION 6. FERTILITY PREFERENCES

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
601	CHECK 314: NEITHER STERILIZED ☐ ▼ HE OR SHE STERILIZED ☐		→612
602	CHECK 234: NOT PREGNANT OR UNSURE ☐ ▼ PREGNANT ☐ ▼ Now I have some questions about the future. Would you like to have (a/another) child, or would you prefer not to have any (more) children? Now I have some questions about the future. After the child you are expecting now, would you like to have another child, or would you prefer not to have any more children?	HAVE (A/ANOTHER) CHILD ..... 1 NO MORE/NONE ..... 2 SAYS SHE CAN'T GET PREGNANT .. 3 UNDECIDED/DON'T KNOW 8	→604 →606 →604
603	CHECK 234: NOT PREGNANT OR UNSURE ☐ ▼ PREGNANT ☐ ▼ How long would you like to wait from now before the birth of (a/another) child? After the child you are expecting now, how long would you like to wait before the birth of another child?	MONTHS ..... 1 ▒▒ YEARS ..... 2 ▒▒ SOON/NOW ..... 993 SAYS SHE CAN'T GET PREGNANT 994 AFTER MARRIAGE ..... 995 OTHER _____ 996 (SPECIFY) DON'T KNOW 998	→606
604	CHECK 234: NOT PREGNANT OR UNSURE ☐ ▼ PREGNANT ☐		→607
605	If you became pregnant in the next few weeks, would you be happy, unhappy, or would it not matter very much?	HAPPY ..... 1 UNHAPPY ..... 2 WOULD NOT MATTER 3	
606	CHECK 313: USING A METHOD? NOT ASKED ☐ ▼ NOT CURRENTLY USING ☐ ▼ CURRENTLY USING ☐		→612
607	Do you think you will use a method to delay or avoid pregnancy within the next 12 months?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→609
608	Do you think you will use a method to delay or avoid pregnancy at any time in the future?	YES ..... 1 NO ..... 2 DON'T KNOW 6	→610
609	Which method would you prefer to use?	PILL ..... 01 IUD ..... 02 INJECTIONS ..... 03 DIAPHRAGM/FOAM/JELLY ..... 04 CONDOM ..... 05 FEMALE STERILIZATION ..... 06 MALE STERILIZATION ..... 07 CALENDER/RHYTHM ..... 08 WITHDRAWAL ..... 09 HERB/REMEDIES ..... 10 OTHER _____ 96 (SPECIFY) UNSURE 98	→612

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
610	What is the main reason that you think you will never use a method?	FERTILITY-RELATED REASONS INFREQUENT SEX ..... 22 MENOPAUSAL/HYSTERECTOMY 23 INFERTILE ..... 24 WANTS MORE CHILDREN ..... 26 OPPOSITION TO USE RESPONDENT OPPOSED ..... 31 HUSBAND/PARTNER OPPOSED . 32 OTHERS OPPOSED ..... 33 RELIGIOUS PROHIBITION ..... 34 LACK OF KNOWLEDGE KNOWS NO METHOD ..... 41 KNOWS NO SOURCE ..... 42 METHOD-RELATED REASONS HEALTH CONCERNS ..... 51 FEAR OF SIDE EFFECTS ..... 52 LACK OF ACCESS/TOO FAR .... 53 COST TOO MUCH ..... 54 INCONVENIENT TO USE ..... 55 INTERFERES WITH BODY'S NORMAL PROCESSES ..... 56 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	
612	CHECK 216: HAS LIVING CHILDREN → If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be? NO LIVING CHILDREN → If you could choose exactly the number of children to have in your whole life, how many would that be? PROBE FOR A NUMERIC RESPONSE.	NUMBER ..... [ ][ ] OTHER _____ 96 (SPECIFY)	
614	Would you say that you approve or disapprove of couples using a method to avoid getting pregnant?	APPROVE ..... 1 DISAPPROVE ..... 2 NO OPINION 3	
615	Is it acceptable or not acceptable to you for information on family planning to be provided: On the radio? On the television?	ACCEPTABLE / NOT ACCEPTABLE / DK RADIO ..... 1 2 8 TELEVISION 1 2 8	
616	In the last few months have you heard about family planning and sterilization: On the radio? On the television? In a newspaper or magazine? From a poster? From leaflets or brochures?	YES / NO RADIO ..... 1 2 TELEVISION ..... 1 2 NEWSPAPER OR MAGAZINE . 1 2 POSTER ..... 1 2 LEAFLETS OR BROCHURES . 1 2	
618	In the last few months have you discussed the practice of family planning with your friends, neighbours, or relatives?	YES ..... 1 NO 2	→620
619	With whom? Anyone else? RECORD ALL MENTIONED.	HUSBAND/PARTNER ..... A MOTHER ..... B FATHER ..... C SISTER(S) ..... D BROTHER(S) ..... E DAUGHTER ..... F MOTHER-IN-LAW ..... G FRIENDS/NEIGHBOURS ..... H OTHER _____ X (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
620	CHECK 502: YES, CURRENTLY MARRIED ▼ ☐ YES, LIVING WITH A MAN ▼ ☐ NO, NOT IN UNION ☐		→701
621	Spouses/partners do not always agree on everything. Now I want to ask you about your husband's/partner's views on family planning. Do you think that your husband/partner approves or disapproves of couples using a method to avoid pregnancy?	APPROVES . . . . . 1 DISAPPROVES . . . . . 2 DON'T KNOW 8	
622	How often have you talked to your husband/partner about family planning in the past year?	NEVER . . . . . 1 ONCE OR TWICE . . . . . 2 MORE OFTEN 3	
623	Do you think your husband/partner wants the same number of children that you want, or does he want more or fewer than you want?	SAME NUMBER . . . . . 1 MORE CHILDREN . . . . . 2 FEWER CHILDREN . . . . . 3 DON'T KNOW 8	
624	Who makes the decisions about using methods to avoid pregnancy?	REPONDENT DECIDES . . . . . 01 HUSBAND/PARTNER DECIDES . . . . 02 JOINTLY . . . . . 03 OTHER _____ 96 (SPECIFY)	

SECTION 7: TREATMENT OF WOMEN IN THE HOUSEHOLD

Now I would like to ask you some difficult questions about how you have been treated in your life by other people.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
701	CHECK 502: MARRIED, LIVING WITH A MAN ☐	NO UNION ☐	→703
702	Within the last year, has your partner/husband regularly not provided money you need for food, rent or bills but has money for other things?	YES . . . . . 1 NO 2	
703	Over the last year, has anyone ever kicked, bitten, slapped, hit you with a fist, threaten you with a weapon, such as a knife, a stick, or a gun, or thrown something at you?	YES . . . . . 1 NO . . . . . 2 NO ANSWER 3	→705
704	Have any of your boyfriends or husbands ever kicked, bitten, slapped, hit you with a fist, threaten you with a weapon, such as a knife, a stick, or a gun, or thrown something at you?	YES . . . . . 1 NO . . . . . 2 NO ANSWER 3	→707 →712
705	Can you tell me who has done this to you? Anyone else? RECORD ALL MENTIONED PROBE IF NOT MENTIONED	CURRENT HUSBAND/PARTNER . . . . . A FORMER HUSBAND/PARTNER . . . . . B BOYFRIEND . . . . . C FATHER . . . . . D BROTHER . . . . . E SON . . . . . F DAUGHTER . . . . . G MOTHER . . . . . H FATHER-IN-LAW . . . . . I MOTHER-IN-LAW . . . . . J OTHER MALE RELATIVE . . . . . K OTHER FEMALE RELATIVE . . . . . L MANAGER/FOREMAN/EMPLOYER . . . . M ASSAILANT . . . . . N OTHER _____ X (SPECIFY) NO ANSWER . . . . . Y	
706	Who is the person who did or does beat you most often?	CURRENT HUSBAND/PARTNER . . . . . 01 FORMER HUSBAND/PARTNER . . . . . 02 BOYFRIEND . . . . . 03 FATHER . . . . . 04 BROTHER . . . . . 05 SON . . . . . 06 DAUGHTER . . . . . 07 MOTHER . . . . . 08 FATHER-IN-LAW . . . . . 09 MOTHER-IN-LAW . . . . . 10 OTHER MALE RELATIVE . . . . . 11 OTHER FEMALE RELATIVE . . . . . 12 MANAGER/FOREMAN/EMPLOYER . . . . 13 OTHER _____ 96 (SPECIFY) NO ANSWER 96	
707	Is or was this person always, sometimes or never "on something" (drugs or alcohol) when he/she did this to you?	ALWAYS . . . . . 1 SOMETIMES . . . . . 2 NEVER . . . . . 3 NO ANSWER 6	

708	In the past one year, approximately how many times did this happen to you? IF NONE WRITE '00'	TIMES ..... ▒▒ NO ANSWER 96	
709	Have you ever left a husband/partner because you were being beaten?	YES ..... 1 NO 2	
710	When you were pregnant, has anyone ever kicked, bitten, slapped, hit you with a fist, threaten you with a weapon, such as a knife, a stick, or a gun, or thrown something at you?	YES ..... 1 NO ..... 2 NEVER BEEN PREGNANT 3	
711	In the past year, have you ever been so seriously hurt during a beating that you needed medical attention even if you did not see a doctor?	YES ..... 1 NO ..... 2 NO ANSWER 3	
712	Has anyone ever forced you to have sexual intercourse against your will by threatening, holding you down or hurting you in some way?	YES ..... 1 NO 2	→715
713	Has anyone ever persuaded you to have sexual intercourse when you did not want to?	YES ..... 1 NO 2	→718
715	Did this happen before you were 15 years old?	YES ..... 1 NO ..... 2 NO ANSWER 3	→718
716	How old were you when this first happened?	AGE ..... ▒▒	
717	Who did this to you?	FATHER ..... 01 OTHER MALE RELATIVE ..... 02 BROTHER ..... 03 FAMILY FRIEND/LODGER ..... 04 LANDLORD/FARMER ..... 05 SCHOOL TEACHER/PRINCIPAL ..... 06 MAN/BOY FROM NEIGHBOURHOOD/ SCHOOL/CHURCH ..... 07 MANAGER/FOREMAN/EMPLOYER .... 08 STEPFATHER/MOTHER'S BOYFRIEND 09 BOYFRIEND/HUSBAND ..... 10 STRANGER/RECENT ACQUAINTANCE 11 OTHER _____ 96 (SPECIFY)	→724
718	Before you were 15 years old, did any man touch you against your will in a sexual way, such as unwanted touching, kissing, grabbing or fondling?	YES ..... 1 NO ..... 2 NO ANSWER 3	→721
719	How old were you when this first happened?	AGE ..... ▒▒	
720	Who did this to you?	FATHER ..... 01 OTHER MALE RELATIVE ..... 02 BROTHER ..... 03 FAMILY FRIEND/LODGER ..... 04 LANDLORD/FARMER ..... 05 SCHOOL TEACHER/PRINCIPAL ..... 06 MAN/BOY FROM NEIGHBOURHOOD/ SCHOOL/CHURCH ..... 07 MANAGER/FOREMAN/EMPLOYER .... 08 STEPFATHER/MOTHER'S BOYFRIEND 09 BOYFRIEND/HUSBAND ..... 10 STRANGER/RECENT ACQUAINTANCE 11 OTHER _____ 96 (SPECIFY)	

721	Before you were 15 years old, did any man force you to touch his private parts against your will?	YES ..... 1 NO ..... 2 NO ANSWER 8	→724
722	How old were you when this first happened	AGE ..... ▒▒	
723	Who did this to you?	FATHER ..... 01 OTHER MALE RELATIVE ..... 02 BROTHER ..... 03 FAMILY FRIEND/LODGER ..... 04 LANDLORD/FARMER ..... 05 SCHOOL TEACHER/PRINCIPAL ..... 06 MAN/BOY FROM NEIGHBOURHOOD/ SCHOOL/CHURCH ..... 07 MANAGER/FOREMAN/EMPLOYER .... 08 STEPFATHER/MOTHER'S BOYFRIEND 09 BOYFRIEND/HUSBAND ..... 10 STRANGER/RECENT ACQUAINTANCE 11 OTHER _____ 96 (SPECIFY)	
724	Have you tried to get help from services of any kind bacause of beatings or other bad treatment?	YES ..... 1 NO 2	→726
725	What do or did you use?	SHELTER ..... A COUNSELLING ..... B WOMEN'S CENTRE ..... C SOCIAL WORKER ..... D POLICE ..... E CLINIC/HOSPITAL ..... F OTHER _____ X (SPECIFY)	
726	Would you have liked to have hed help from a service that was not available?	YES ..... 1 NO 2	→801
727	What service would have been helpful to you?	SHELTER ..... A COUNSELLING ..... B WOMEN'S CENTRE ..... C SOCIAL WORKER ..... D POLICE ..... E CLINIC/HOSPITAL ..... F OTHER _____ X (SPECIFY)	

SECTION 8: AIDS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES				SKIP
801	Heve you ever heerd of an illness called AIDS?	YES ..... 1 NO 2				—→901
802	How much information about HIV/AIDS did you obtain from each of the following sources: Answer each question with a lot, some or none		A LOT	SOME	NONE	
	a) TV?	TV	1	2	3	
	b) Radio?	RADIO	1	2	3	
	c) Newspeper?	NEWSPAPER	1	2	3	
	d) Pamphlets?	PAMPHLETS	1	2	3	
	e) Health Workers?	HEALTH WORKERS	1	2	3	
	f) Friends?	FRIENDS	1	2	3	
	g) Partner(s)?	PARTNER(S)	1	2	3	
	h) Relatives?	RELATIVES	1	2	3	
803	I am going to read out some statements about protection egainst HIV/AIDS. For each statement, please tell me whether you think it is true or not. People can protect themselves from HIV/AIDS by:		TRUE	NOT TRUE	DON'T KNOW	
	a) having a good diet	DIET	1	2	8	
	b) steying with one faithful partner	FAITHFUL	1	2	8	
	c) avoiding public toilets	AVOID TOILETS	1	2	8	
	d) using condoms during sexual intercourse	CONDOMS	1	2	8	
	e) avoiding touching a person who has AIDS	AVOID TOUCH	1	2	8	
	f) avoiding sharing food with a person who has AIDS	AVOID SHARED FOOD	1	2	8	
	g) avoiding being bitten by mosquitos or similar insects	AVOID MOSQUITOS	1	2	8	
	h) making sure any injection they heve is done with a clean needle	CLEAN INJECTION	1	2	8	
	I) avoid shering razor blades	AVOID RAZOR	1	2	8	
804	Do you think thet e person infected with the AIDS virus always shows symptoms or can such a person look perfectly healthy?	ALWAYS SHOWS SYMPTOMS ..... 1 CAN LOOK HEALTHY ..... 2 DON'T KNOW 8				
804A	I am going to ask you some questions about the need for people to be informed about their HIV/AIDS status:		TRUE	NOT TRUE	DON'T KNOW	
	a) should people with AIDS be told about their status?	TOLD ABOUT AIDS	1	2	8	
	b) should people diagnosed HIV positive be told about their status?	TOLD ABOUT HIV	1	2	8	
	c) should HIV/AIDS patients tell their partner(s) about their status?	TELL PARTNERS	1	2	8	
	d) should the reporting of AIDS status to health authorities be made mendatory by law?	REPORT AIDS	1	2	8	
	e) should the reporting of HIV status to health authorities be made mandatory by law?	REPORT HIV	1	2	8	
805	Do you personally know someone who has been diagnosed with HIV/AIDS or who has died of AIDS?	YES ..... 1 NO 2				—→901
805A	How much assistance and support do you think AIDS patients receive from each of the following: Answer the questions with a lot, some or none.		ALOT	SOME	NONE	
	a) employers?	A) EMPLOYERS	1	2	3	
	b) co-workers?	B) CO-WORKERS	1	2	3	
	c) insurance companies?	C) INSURANCE C.	1	2	3	
	d) health workers?	D) HEALTH WORKERS	1	2	3	
	e) friends?	E) FRIENDS	1	2	3	
	f) partner(s)?	F) PARTNER(S)	1	2	3	
	g) relatives?	G) RELATIVES	1		23	

SECTION 9 - MATERNAL MORTALITY

No.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
901	Now I would like to ask some questions about your brothers and sisters, that is, all of the children born to your natural mother, including those who are living with you, those living elsewhere and those who have died. How many children did your mother give birth to, including you?		
	NUMBER OF BIRTHS TO NATURAL MOTHER	☐☐	

902 CHECK 901: TWO OR MORE BIRTHS ☐ ▼ | ONLY ONE BIRTH (RESPONDENT ONLY) ☐ → 1001

903 How many of these births did your mother have before you were born? | NUMBER OF PRECEDING BIRTHS ☐☐

904 What was the name given to your eldest (next oldest) brother or sister?	905 Is (NAME) male or female?	906 Is (NAME) still alive?	907 How old is (NAME)?	908 In what year did (NAME) die?	909 How many years ago did (NAME) die?	910 How old was (NAME) when she/he died?
[1] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 ↵ GO TO 908 DK ..... 8 ↵ GO TO [2]	☐☐ GO TO [2]	☐☐☐☐ GO TO 910 DK 9998	☐☐	☐☐ IF MALE OR DIED BEFORE AGE 12 GO TO [2]
[2] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 ↵ GO TO 908 DK ..... 8 ↵ GO TO [3]	☐☐ GO TO [3]	☐☐☐☐ GO TO 910 DK 9998	☐☐	☐☐ IF MALE OR DIED BEFORE AGE 12 GO TO [3]
[3] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 ↵ GO TO 908 DK ..... 8 ↵ GO TO [4]	☐☐ GO TO [4]	☐☐☐☐ GO TO 910 DK 9998	☐☐	☐☐ IF MALE OR DIED BEFORE AGE 12 GO TO [4]
[4] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 ↵ GO TO 908 DK ..... 8 ↵ GO TO [5]	☐☐ GO TO [5]	☐☐☐☐ GO TO 910 DK 9998	☐☐	☐☐ IF MALE OR DIED BEFORE AGE 12 GO TO [5]
[5] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 ↵ GO TO 908 DK ..... 8 ↵ GO TO [6]	☐☐ GO TO [6]	☐☐☐☐ GO TO 910 DK 9998	☐☐	☐☐ IF MALE OR DIED BEFORE AGE 12 GO TO [6]
[6] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 ↵ GO TO 908 DK ..... 8 ↵ GO TO [7]	☐☐ GO TO [7]	☐☐☐☐ GO TO 910 DK 9998	☐☐	☐☐ IF MALE OR DIED BEFORE AGE 12 GO TO [7]

911 Was (NAME) pregnant when she died?	912 Did (NAME) die during childbirth?	913 Did (NAME) die within two months after the end of a pregnancy or childbirth?	914 Was her death due to complications of pregnancy or childbirth?	915 How many children did (NAME) give birth to during her lifetime?
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	 GO TO [2]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	 GO TO [3]
YES ..... 1 GOT TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	 GO TO [4]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	 GO TO [5]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	 GO TO [6]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	 GO TO [7]

904 What was the name given to your eldest (next oldest) brother or sister?	905 Is (NAME) male or female?	906 Is (NAME) still alive?	907 How old is (NAME)?	908 In what year did (NAME) die?	909 How many years ago did (NAME) die?	910 How old was (NAME) when she/he died?
[7] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [8]	GO TO [8]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [8]
[8] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [9]	GO TO [9]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [9]
[9] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [10]	GO TO [10]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [10]
[10] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [11]	GO TO [11]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [11]
[11] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [12]	GO TO [12]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [12]
[12] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [13]	GO TO [13]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [13]
[13] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [14]	GO TO [14]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [14]
[14] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [15]	GO TO [15]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [15]
[15] _____	MALE ..... 1 FEMALE ... 2	YES ..... 1 NO ..... 2 GO TO 908 DK ..... 8 GO TO [16]	GO TO [16]	GO TO 910 DK 9998		IF MALE OR DIED BEFORE AGE 12 GO TO [16]

911 Was (NAME) pregnant when she died?	912 Did (NAME) die during childbirth?	913 Did (NAME) die within two months after the end of a pregnancy or childbirth?	914 Was her death due to complications of pregnancy or childbirth?	915 How many children did (NAME) give birth to during her lifetime?
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [8]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [9]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [10]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [11]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [12]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [13]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [14]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [15]
YES ..... 1 GO TO 914 NO 2	YES ..... 1 GO TO 915 NO 2	YES ..... 1 NO ..... 2 GO TO 915	YES ..... 1 NO 2	GO TO [16]

SECTION 10. HUSBAND'S BACKGROUND, WOMAN'S WORK AND RESIDENCE

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1001	CHECK 502 AND 504: CURRENTLY MARRIED/ LIVING WITH A MAN ☐ FORMERLY MARRIED/ LIVED WITH A MAN ☐ NEVER MARRIED AND NEVER IN UNION ☐		→1003 →1009
1002	How old was your husband/partner on his last birthday?	AGE ..... ☐☐	
1003	Did your (last) husband/partner ever attend school?	YES ..... 1 NO 2	→1005
1004	What was the highest (standard/year) he completed at school?	LESS THAN 1 YEAR COMPLETED . 00 SUB A/CLASS 1 ..... 71 SUB B/CLASS 2 ..... 72 STANDARD 1 ..... 01 STANDARD 2 ..... 02 STANDARD 3 ..... 03 STANDARD 4 ..... 04 STANDARD 5 ..... 05 STANDARD 6 ..... 06 STANDARD 7 ..... 07 STANDARD 8 ..... 08 STANDARD 9 ..... 09 STANDARD 10 ..... 10 FURTHER STUDIES INCOMPLETE . 11 DIPLOMA/OTHER POSTSCHOOL COMPLETE ..... 12 FURTHER DEGREE COMPLETE .. 13 DON'T KNOW 98	
1005	Does your husband/partner currently work?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
1006	What (is/was) your (last) husband/partner's occupation? That is, what kind of work (does/did) he mainly do?	☐☐ _____ _____ _____	
1009	Aside from your own housework, are you currently working for money?	YES ..... 1 NO 2	→101 2
1010	As you know, some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. Are you currently doing any of these things or any other work?	YES ..... 1 NO 2	→101 2
1011	Have you done any work in the last 12 months?	YES ..... 1 NO 2	→102 6
1012	What is your occupation, that is, what kind of work do you mainly do?	☐☐ _____ _____ _____	
1015	Do you do this work for a family business, are you employed by someone outside the family or are you self-employed?	FOR FAMILY MEMBER ..... 1 FOR SOMEONE ELSE ..... 2 SELF-EMPLOYED 3	
1016	Do you usually work throughout the year, or do you work seasonally, or only once in a while?	THROUGHOUT THE YEAR ..... 1 SEASONALLY/PART OF THE YEAR . 2 ONCE IN A WHILE 3	→1018 →1019

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1017	During the last 12 months, how many months did you work?	NUMBER OF MONTHS ... [ ][ ]	
1018	During the last 12 months, how many days a week did you usually work (in the months that you worked) ?	NUMBER OF DAYS ..... [ ]	→1020
1019	During the last 12 months, approximately how many days did you work?	NUMBER OF DAYS .. [ ][ ][ ]	
1020	Do you earn cash for your work? PROBE: Do you make money for working?	YES ..... 1 NO 2	→1023
1021	How much do you usually earn for this work? PROBE: Is this by the day, by the week, or by the month?	PER HOUR 1 [ ][ ][ ][ ][ ][ ] PER DAY . 2 [ ][ ][ ][ ][ ][ ] PER WEEK 3 [ ][ ][ ][ ][ ][ ] PER MONTH4 [ ][ ][ ][ ][ ][ ] PER YEAR 5 [ ][ ][ ][ ][ ][ ] OTHER _____ ___9999998 (SPECIFY)	
1022	CHECK 502: YES, CURRENTLY MARRIED YES, LIVING WITH A MAN Who mainly decides how the money you earn will be used: you, your husband/partner, you and your husband/partner jointly, or someone else? O, NOT IN UNION Who mainly decides how the money you earn will be used: you, someone else, or you and someone else jointly?	RESPONDENT DECIDES ..... 1 HUSBAND/PARTNER DECIDES .... 2 JOINTLY WITH HUSBAND/PARTNER 3 SOMEONE ELSE DECIDES ..... 4 JOINTLY WITH SOMEONE ELSE ... 5	
1023	Do you usually work at home or away from home?	HOME ..... 1 AWAY 2	
1024	CHECK 222 AND 223: IS A CHILD LIVING AT HOME WHO IS AGE 5 OR LESS? YES [ ] NO [ ]		→1026
1025	Who usually takes care of (NAME OF YOUNGEST CHILD AT HOME) while you are working?	RESPONDENT ..... 01 HUSBAND/PARTNER ..... 02 OLDER FEMALE CHILD ..... 03 OLDER MALE CHILD ..... 04 OTHER RELATIVES ..... 05 NEIGHBORS ..... 06 FRIENDS ..... 07 SERVANTS/HIRED HELP ..... 08 CHILD IS IN SCHOOL ..... 09 INSTITUTIONAL CHILD CARE ..... 10 HAS NOT WORKED SINCE LAST BIRTH ..... 95 OTHER _____ 96 (SPECIFY)	
1026	RECORD THE TIME	HOURS [ ][ ] MINUTES [ ][ ]	

INTERVIEWERS OBSERVATION

Comments about the respondent/s: _____

_____

_____

_____

Comments on Specific Questions: _____

_____

_____

_____

Any other comments: _____

_____

_____

_____

SUPERVISOR'S OBSERVATION

_____

_____

_____

_____

Name of Supervisor: _____ Date: _____

EDITOR'S OBSERVATIONS

_____

_____

_____

_____

Name of Editor: _____ Date: _____

W-ENG41

APPENDIX B: Variables included in the asset index

Electricity
Has electricity

Durable goods
Own radio
Own television
Own refrigerator
Own bicycle
Own motorcycle
Own car
Own telephone
Own personal computer
Own washing machine
Own donkey/horse
Own sheep/cattle

Fuel used for cooking
Uses electricity for cooking/heating
Uses gas for cooking/heating
Uses coal for cooking/heating
Uses animal dung for cooking/heating
Uses other fuel for cooking/heating

Source of drinking water
If piped drinking water in dwelling
If piped drinking water in public tap
If drinking water from water carrier/tanker
If drinking water from borehole/well
If drinking water from dam/river/stream/spring
If drinking water from rainwater tank
If drink bottled water
Other source of drinking water

Sanitation facility
If has own flush toilet
If uses shared flush toilet
If uses bucket latrine
If uses pit latrine
If has no toilet facility
If uses other toilet facility

Main floor material
If main floor material is earth
If main floor material is wood
If main floor material is tiles
If main floor material is parquet
If other floor material

Main wall material
If has plastic or cardboard walls
If has mud walls
If has prefab walls
If has bare brick walls
If has plastered walls
If other wall material

Frequency of household hunger
If often goes hungry
If sometimes goes hungry
If seldom goes hungry
If never goes hungry

Persons per sleeping room

Number of members per sleeping room

Variables with factor loading > |.50|
Has electricity
Own television
Own refrigerator
Own car
Own telephone
Own washing machine
Uses electricity for cooking/heating
Uses other fuel (wood) for cooking/heating
If piped drinking water in dwelling
If has own flush toilet
If main floor material is earth
If has mud walls
If has plastered walls
If never goes hung