

# Cross-sectional comparisons of violence and injuries among adults in a rural community, South Africa

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## **ABSTRACT**

Violence and injuries are a global multifaceted health phenomenon with biological, psychological, social and environmental roots combining individual, relationship, social, cultural and environmental factors. Violence and injuries have been declared an international public health risk, however little is known about violence and injuries in the South African context especially in rural areas. In South Africa (SA) the injury death rate is almost twice the global average. These violence and injuries in SA have contributed to a high disease burden compared to other parts of the world. There is an underlying assumption that rural areas are safer than the urban environment, yet this is not always true.

The aim of this study is to describe the trends in violence and injuries among adults aged 35 to 70 years living in a rural area within the North West Province over a period of 10 years. Data from the South African leg of the Prospective Urban and Rural Epidemiological (PURE-SA) study was used. The PURE-SA study is designed as an observational, cohort study where data collection occurred cross-sectionally at five year intervals 2005, 2010, 2015.

The top three violence and injury events reported over the 10 year period of this study were two un-intentional injuries (falls and motor vehicle accidents [MVAs]) and violent acts. Violent events like physical assault, domestic violence and armed conflict were reported less than expected for all three data collection periods (2005, 2010 and 2015). However studies have shown that rural areas are specifically prone to under-reporting of violent acts. Even though violence was not widely reported in the present study, according to the views of the participants the increase of violent acts and crime is a primary concern to the community.

There is a lot of room for improvement and research regarding violence and injuries on an individual, relationship, community and societal level. Collecting data regarding violence and injuries and the people's views of crime increase is a start to understand violence and injuries in a rural area about which little is known. A transdisciplinary approach needs to be taken in research for developing a rural-specific intervention regarding community health and safety.

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## LIST OF ABBREVIATIONS

CDC	Centre for Disease Control and Prevention
DALY	Disability-adjusted life-year
DHSA	Department of Health South Africa
HIC	High-income countries
HIV	Human immunodeficiency virus
IPV	Intimate partner violence
LMICs	Low- and middle-income countries
MVAs	Motor vehicle accidents
NCDs	Non-communicable diseases
NIMSS	National Injury Mortality Surveillance System
NGO's	Non-governmental organisations or programs
PI	Principal investigator
PURE	Prospective Urban and Rural Epidemiological study
PURE-SA	Prospective Urban and Rural Epidemiological study South Africa
RTIs	Road traffic injuries
SA	South Africa
SAMRC	South African Medical Research Council
SES	Socio-economic status
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan africa
STI	Sexually transmittable infections
UNICEF	United Nations Children's Fund works for children's rights
WHO	World Health Organisation

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# CHAPTER 1: BACKGROUND AND MOTIVATION FOR THIS STUDY

## 1.1 General introduction

Annually more than 1.3 million people die globally as a result of violence (World Health Organization [WHO], 2014:2). In South Africa (SA) the injury death rate is almost twice the global average (Matzopoulos *et al.*, 2015:311; Seedat *et al.*, 2009:1011), excluding the survivors suffering permanent disabling consequences (El Tayeb, 2014:4; Norman *et al.*, 2007:695). There is an underlying assumption that rural areas are safer than the urban environment, yet this is not always true in SA (Otieno *et al.*, 2015:1). In this chapter an overview of the study regarding the background, theoretical framework, methodology as well as considerations regarding health research ethics will be discussed.

## 1.2 Background

Health is foundational to everyday life, not just an objective of living (Mahler *et al.*, 1986:1) and improved health is central to well-being of an individual and a community. It contributes to economic progress as healthy populations live longer, are more productive and spend less on health costs (WHO, 2015). Remaining healthy is a continuous process because the patterns of disease progress along with society's progress (Tulchinsky & Varavikova, 2014:29). Consequently, the complexities of health should be dealt with in a holistic approach (Oostra, 2014:66; Strandberg *et al.*, 2007:1). Various factors like the health literacy gap, geographical areas and economic status (Braveman *et al.*, 2011:383) influence health and a country's ability to provide quality health services (WHO, 2015).

To protect communities from contagious and environmental health threats, the global public health arena is expanding to counter and prevent new and contemporary health risks such as violence and injuries, substance abuse, sexually transmitted infections (STI's) such as human immunodeficiency virus (HIV), and bioterrorism (James & Morrow, 2013:2). Violence and injuries are also a major contributing factor to poor health (Bellis *et al.*, 2012:8) because behavioural factors are integral in the aetiology and prevention of disease (Dahlberg & Marcy, 2009:167). Violence can be referred to as 'intentional injuries' for example assault. 'Unintentional injuries' refers to injuries that are accidents, for example car accidents (Norton & Kobusingye, 2013:1723). However, Cloutier *et al.* (2003:474) pointed out that there are shared risk factors relating to intentional and unintentional injuries for example people with lower socioeconomic status are more likely to be victims of or witnesses to intentional and unintentional injuries than people with more financial resources. Another example is alcohol abuse. The degree to which alcohol and other drugs act as risk factors to intentional and unintentional injuries is one of the clearest intersections. The Department of Health South Africa (DHSA) considers violence and injuries as one combined indicator (DHSA, 2010).

Violence can result in serious injuries and even death (Elrod & Ryder, 2013:391). According to the WHO (2014b:2) violence results in more than 1.3 million deaths annually, making violence the fourth leading cause of death worldwide. This excludes victims of assault who sustain physical, sexual and psychological injuries, as well as those not reporting the injuries to health or other authorities (WHO, 2014b:2). The burden of injury-related deaths excessively affects poor families living in low- and middle-income countries (LMIC) similar to the South African context (Gyedu *et al.*, 2014:2). Globally the total number of injury-related deaths stands at 89%, compared with 84% of deaths from all causes (Norton & Kobusingye, 2013:1723; Tulchinsky & Varavikova, 2014:279). In SA the overall injury death rate of 1578 per 100 000 of the population is nearly twice the global average (Garrib *et al.*, 2011:439). Although mortality due to injuries has decreased since 2009, high levels of interpersonal violence and accidents remain (Mayosi *et al.*, 2012:5). Additionally, for every person killed by injury, around 30 times as many are hospitalised and 300 times as many are treated for less serious injuries (Van Niekerk *et al.*, 2008:5).

During Apartheid, black people were forcibly removed from their fertile, productive ancestral lands to dry unproductive batches of rural land (Kgatla, 2013:41). These rural areas are associated with high levels of socio-economic inequalities (Netshitenzhe, 2014:1). People in rural SA are exposed to poor social progress in terms of education, skills development, access to clean water, electricity and sanitation, compared to their urban counterparts (Kongolo & Bamgose, 2013:79; Neves & Toit, 2013:93; Noble, & Wright, 2013:187). This has resulted in high levels of unemployment and illiteracy in the rural areas in SA (Blalock, 2014:12). According to Rapp *et al.* (2012), there is a link between levels of education and the occurrence of violence. In addition, the huge socio-economic inequality gap in the rural areas in SA has been the major risk factor for violence and injuries (Lehohla & Shabalala, 2014:479).

SA is in the midst of a health transition that is characterised by the simultaneous occurrence of epidemic infectious diseases and a rise in non-communicable diseases, (NCD's) in a population facing a heavy burden of perinatal and maternal disorders, violence and injuries (Mayosi *et al.*, 2009:1011). The recommended framework for a national violence and injuries prevention programme should be underpinned by research undertaken locally or within a specific social context. Data collection and research need to be improved and sustained to inform prevention efforts on an on-going basis.

### **1.3 Motivation and problem statement**

Although violence and injuries have been declared an international public health risk, little is known about violence and injuries in a rural community, especially in the South African context (Haegerich & Dahlberg, 2011:392; McGrath *et al.*, 2012:589). In SA, information on violence

and injuries is mostly derived from small surveys and epidemiological studies, with few data available in rural areas (Garrib *et al.*, 2011:439). Until 2009 no data source existed that could be used to study prevalence trends in violence (Mayosi *et al.*, 2012:1013). The rural community at hand is part of the traditional territory of the local Tswana. The community has little infrastructure, with no non-governmental organisations or programmes (NGO's) addressing violence and injuries, one police station and one hospital that are difficult to access for some community members because of distance. This study investigates the changes in violence and injury rates amongst adults over a period of 10 years in a rural community in Dr Kenneth Kaunda District, North-West Province of SA, with a view to describing the trends of violence and injuries in this rural area to make recommendations from a transdisciplinary approach.

#### **1.4 Theoretical framework**

Bronfenbrenner's social-ecological model (Bronfenbrenner, 1979) which is widely used in violence research and literature (Banyard, 2011:216; Bowman *et al.*, 2014:283; Cicchetti & Lynch, 1993:97; Logie *et al.*, 2014:4) will serve as the theoretical framework in this study. The social-ecological model consists of four levels illustrating the interaction between risk factors for violence at the individual, relationship, community and societal levels, each focusing on a different aspect of human life (Bellis *et al.*, 2012:27). The 'Individual' level of the social-ecological model addresses biological and personal characteristics that may influence injury-related behaviour. The 'Relationship' level addresses the influence of close interpersonal relationships. The 'Community' level focuses on the characteristics of communities or settings within communities that may create conditions that increase or decrease the risk of violence. The 'Societal' level encompasses the influence of broad cultural, social, and economic factors on the risk of violence and its prevention (Powell *et al.*, 2008:1816). In this study the social-ecological model will be used as a framework to understand the complexities of violence and injuries as well as to display the effect that violence and injuries have in communities. Moreover, the model is aligned with a transdisciplinary approach combating violence as the prevention of violence requires collective action.

#### **1.5 Aims and objectives**

##### **1.5.1 Aim**

The aim of this study is to describe the trends in violence and injuries among adults aged 35 to 70 years in a rural area within the North West Province over a period of 10 years.

##### **1.5.2 Objectives**

- To determine the types and frequency of violence and injuries as baseline and five-year follow-ups (2005, 2010 and 2015).

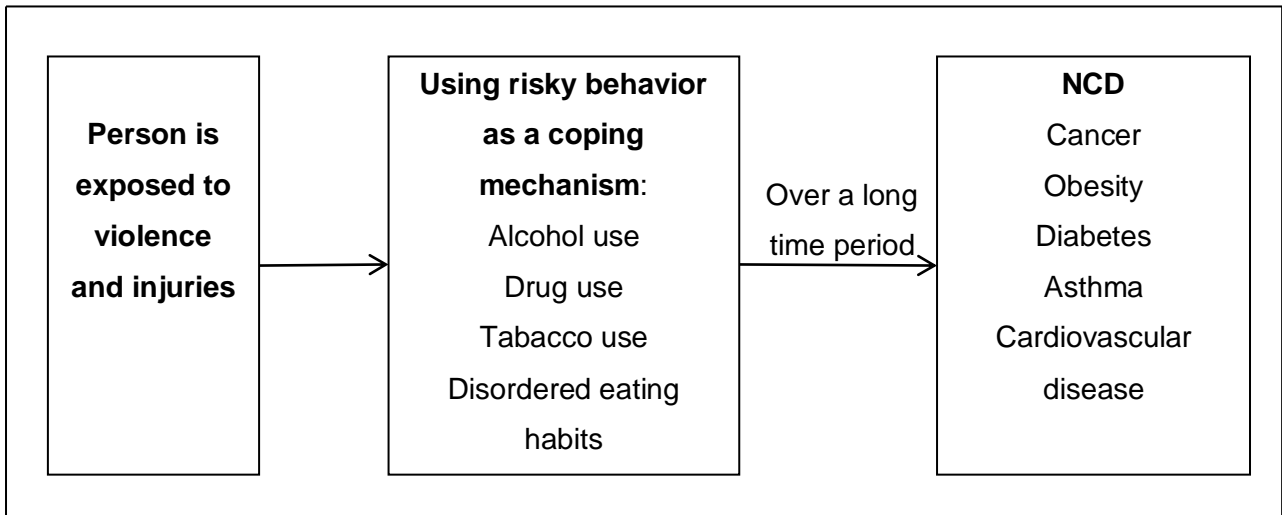
- To investigate possible changes in the type and frequency of violence and injuries over ten years.

### **1.6 Contextualisation within the PURE study**

This study forms part of the Prospective Urban and Rural Epidemiology (PURE) study. The South African arm of the study is referred to as PURE-SA. The primary aim of the PURE study is to examine the relationship between societal influences on human lifestyle behaviour, cardiovascular risk factors, and the incidence of NCDs (Corsi *et al.*, 2013:636; Teo *et al.*, 2009:2). The burden of morbidity and mortality from NCDs has risen worldwide and is accelerating in LMIC (Catalano *et al.*, 2012:1653) such as SA. In the PURE study it is hypothesised that behavioural and psychosocial transitions secondary to urbanisation, industrialisation and changes in the built-up and commercial environment are associated with the development of NCD's (Hamilton Health Sciences Corporation & McMaster University, 2007:4; Teo *et al.*, 2009:1). These changes interact with high risk behaviour associated with violence and injuries, leading to increased NCD's and overall poor health (Gass *et al.*, 2010:582; Kontis *et al.*, 2014:3). The risk behaviour associated with violence and injuries are alcohol abuse, drug use, tobacco use, disordered eating habits and risky sexual behaviour (Cloutier *et al.*, 2002:265; WHO, 2014b:16). The long-term effect of this high-risk behaviour only becomes apparent at a later stage of the person's life when NCD's develop because of their behaviour (Santaularia *et al.*, 2014:2).

Prospects for violence and injuries are greater in certain settings than others, especially in regions and communities where people live in poverty (Matzopoulos *et al.*, 2010b:4; Winnersjo *et al.*, 2012:88). Extreme poverty is often associated with violence and injuries whether in the form of large-scale conflict or in the oppression and domination exercised by the authorities over the already poverty-stricken weak people (Crais, 2011:2).

Rural communities in particular are characterised by low socioeconomic status (SES) that contributes to the risk factor for violence and injuries (Doolan *et al.*, 2007). It is in this context that the study will attempt to describe the occurrence of different forms of violence and injuries over a ten-year period as they are among the major risk factors for NCD's and poor health in rural communities in SA (Gass *et al.*, 2010:582).



**Figure 1-1: The causal pathway of violence and injuries and non-communicable diseases** (Santaularia *et al.*, 2014:2)

## 1.7 Research methodology

### 1.7.1 Study setting

**Study context:** The rural communities that took part were not randomly selected but had to meet certain inclusion criteria. The main criterion for the community selection was that there should be migration stability within the chosen rural community. The communities also had to be part of the North-West Province, South Africa. The rural area had to be a large enough community to allow random selection of subjects, had to be approximately 100 km from urban areas, with as little urban influence as possible and had to be logistically accessible to researchers. Two rural communities were chosen: the first is situated 450 km west of Potchefstroom on the highway to Botswana and the second is a deep rural community situated 35 km north-east from the first rural community. The second rural community is only accessible by gravel road. Both rural communities are still under tribal law and have the same chief (Kruger & Kruger, 2015:8).

**Study setting:** Participants were collected at a central point within the community by public transport or known as a taxi, and brought to the research facility situated within the rural community. A local lodge's infrastructure was used for data collection for the duration of the study. A combination of guest rooms, offices, tents and gazebos were set up and used on the premises. Each researcher received a closed off designated area for performing specified clinical procedures and interviews privately (Kruger & Kruger, 2015:17).

### **1.7.2 Target population**

The target population was Tswana-speaking males and females within specific rural communities (referred to as A and B) under the Municipality of the Dr Kenneth Kaunda District in the North-West Province.

### **1.7.3 Inclusion criteria**

In order to partake in the PURE-SA study, participants had to comply with the criteria of being between the age of 35 and 70 years and have no known NCD's at baseline (2005).

### **1.7.4 Study design**

The PURE-SA study is a longitudinal study, implying that an observational research method is repeatedly used for data collection, from the same participants (Aschengrau & Seage, 2014:207), every five years in a cross-sectional manner. In this study descriptive statistical analysis will be done with the cross-sectional data that were collected at five-year intervals (2005, 2010, 2015). This implies extrapolation of data related to violence and injuries in the stated population to describe the trends since the study started in 2005 and analysing the incidents of exposure to violence and injuries.

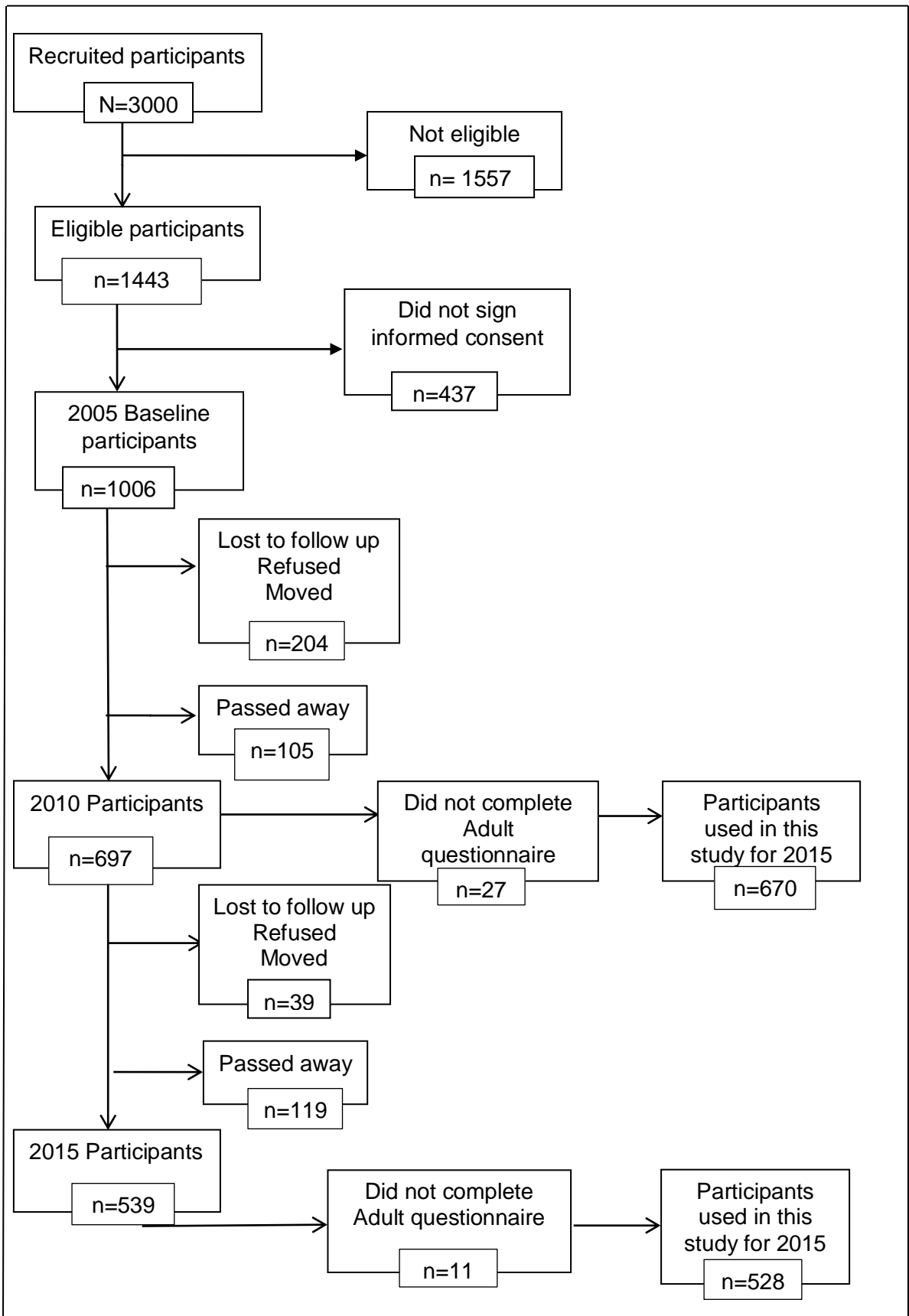
### **1.7.5 Sampling**

#### **1.7.5.1 Sampling technique**

The population consisted of everyone living in community A and B above the age of 35 and younger than 70 years. In 2005 a household census regarding the number of people, their ages and health profile was done in 3 000 households, 1 500 in each community starting at a specific point. The head of the household signed a written informed consent form to fill out the questionnaire. If a person refused or was not at home, the neighbouring house was taken and a non-complier questionnaire was filled out. In this study all the data from the participants recruited in the 2005 PURE-SA study and completed during the follow-up questionnaires in 2010 and 2015 were selected.

#### **1.7.5.2 Determination of sample size**

At baseline (2005) the PURE-SA study approached 3 000 participants from 833 households. During the participant selection process 1 557 participants met the inclusion criteria and were invited to the study. On the day data capturing started (2005) a total of 1 006 participants signed informed consent and participated in the study. Some participants were lost due to mortality, frailty, discontinued participation, failure in re-contacting the participant for a follow-up survey or



**Figure 1-2: Participant attrition for PURE-SA rural area**

by non-return of a survey by a participant. In 2010 and 2015 the number of participants was 697 and 539, respectively.

During data collection not all of the participants managed to complete the adult questionnaires used for this study, therefore the study's participant numbers are as follows:

**Table 1-1: Sample size for present study**

<b>Year</b>	<b>Active participants* in PURE-SA study</b>	<b>Participants who did not complete the Adult questionnaires</b>	<b>Participants included in this sub-study</b>
2005	1006	0	1006
2010	697	27	670
2015	539	11	528

\*Active participants: Participants that indicated before each follow-up session they would again attend data collection

The researchers are aware of the fact that less than 50% of the original number of participants were available for follow-up in 2015. However, the aim of this proposed sub-study is not to generalise to the broader South African community, rather to contextualise to the specific rural community.

## **1.8 Data collection tool**

### **1.8.1 Rigour**

As this study was part of the larger multinational PURE study, the same questionnaires were used globally within each country participating within the PURE study. To enable cross-country comparison it was essential that each country used the same questionnaire. Hence the content of the questionnaires could not be adapted in any way. The quality of the data was standardised by making use of a comprehensive operations manual, periodic training workshops, training DVD's, and regular communication with the coordinating office in Canada. All data were entered in a customised database programmed with range and consistency checks and transmitted electronically to the Project Office at the Population Health Research Institute in Hamilton (Ontario, Canada) where further quality control measures were implemented (Teo *et al.*, 2009:3). Quality of data collection was maintained through the use of standardised protocols and centralised training (Teo *et al.*, 2009:3). All of the researchers and assistants that were part of this study were all experienced in their fields and all staff members were standardised in terms of data collection and completion of questionnaires prior to the study. The fieldworkers were re-trained intensively every time prior to any form of data collection (Teo *et al.*, 2009:4).

## **1.9 Data collection process**

Data collection took place in the form of a standardised semi-structured questionnaire. The questionnaire focused on the individual person and his/her overall health. The questions asked focused on the participant's violence and injury count, for example (the number of injuries the participant sustained in the previous 12 months) and the participant's views of violence levels in the community. (For the complete set of questions that were used see Annexure A).

### **1.9.1 Recruitment of participants**

A randomised selection approach was used to recruit participants. This approach is a method of drawing a portion or a population so that each member of the population has an equal chance of being selected (De Vos *et al.*, 2011:228). At the start of the study in 2005 the fieldworkers appointed for the PURE-SA study recruited participants by personal door-to-door visits. Households were eligible if at least one member of the household was between the ages of 35 and 70 years and the household members intended to continue living in their current home for a further five years. All individuals within these households between 35 and 70 years providing written informed consent were enrolled.

### **1.10 Statistical analyses**

The completed Adult questionnaires were captured on MS Excel and SPSS (Statistical Package for Social Sciences). A descriptive statistical analysis was done of the 2005, 2010 and 2015 data. It involved giving a description of how violence and injuries had been occurring starting at 2005 up to 2015. SPSS was used to generate descriptive data (frequencies, means and standard deviations). A two-sample Z-score test was used to compare the proportions for the three cross-sectional periods. A p-value of < 0.05 was regarded as significant.

### **1.11 Ethical considerations**

#### **1.11.1 Permission and informed consent**

**Legal authorisation:** The PURE-SA study had already obtained permission in the above-mentioned communities. Advice on recruitment procedures was obtained from the North West Department of Health, tribal chiefs, community leaders, employers and mayors. The PURE-SA study was approved by the Health Research Ethics Committee of the Potchefstroom Campus at the North-West University for the period January 2005 to December 2009 (ethical number 04M10) as well as for the period January 2010 to December 2015 (ethical number NWU-00016-10-A1). Extension on the ethical approval was obtained until January 2020 (NWU-00016-10-A1).

**Goodwill permission:** The principle investigator (PI) of PURE-SA study made an appointment with the tribal chief of communities A and B. During the meetings the PI fully informed them

about the aims of the study and what the possible outcomes and benefits of the study would be. The research procedures were also explained, and permission was granted to proceed with the planned study. After permission was obtained from the tribal chief of the rural communities A and B the community leaders acting as the gatekeepers for each community were approached. Verbal permission was obtained from the gatekeepers to perform the study within their communities. This was done again prior to the 2010 and 2015 follow-up study as an act of respect.

**Participant written informed consent:** It is a legal requirement to attain written informed consent from participants before participating in any research. Since the PURE-SA study is a longitudinal study and research is on-going, the fieldworkers obtain re-consent from all current active participants prior to the data gathering sessions. The fieldworkers performed house visits to each individual at least three (3) months prior to the start of the study. During these visits they informed the participants about the upcoming follow-up study. All of the interviews that were performed on the day of the study was then discussed and explained. The participant was given a one (1) week period to consider further participation in the study. After a week the fieldworker visited the participant again, and if the participant agreed to partake in the study, the fieldworker obtained re-consent. In the case where the participant was illiterate, a right thumb ink print was taken as substitute for a signature. When a participant had refused in the past to participate further or there was a case where a participant had moved out of the community, and had recently returned, the participants were also visited again to be re-invited back into the study. If they were willing to participate or return to the study, they were fully briefed about the study and re-consent was obtained by the fieldworker (Please see informed consent form at Annexure B).

### **1.11.2 Anonymity**

People, whether or not in a research setting, should always be treated in such a way that they can exercise their right to autonomy. This includes their right to privacy and confidentiality. During the completion of the questionnaires, only the researcher and / or assistant were present. No other members of the research team or participants were allowed within the designated areas when the questionnaires were completed.

### **1.11.3 Confidentiality**

Each participant was assigned a unique participant number during the initial baseline data collection in 2005. This unique number was used in all stages of data collection. Upon arrival on the day of the study, the participant needed to provide their South African identity document, in order to verify the identification (ID) number against their unique participant number. This was

done only by the project coordinators. No other researcher and / or assistant will have access to this information or be involved in the process.

#### **1.11.4 Justification of research study**

This study will contribute to the gap in statistics and especially longitudinal statistics on violence and injuries in rural areas in SA. With the description of violence and injuries and some of the risk factors in a rural area possible recommendations for the prevention of violence and injuries can be made.

#### **1.11.5 Reimbursement of study participants**

Participants were transported to the research facility by transport provided by the research study (North-West University) and no travelling expenses were foreseen. Breakfast and lunch were provided to the participants and they were also financially compensated. In 2005 and 2010 the amount of R50.00 (fifty rand) per day and in 2015, R100.00 (one hundred rand) was paid for any expenses or loss of income incurred due to their attendance.

#### **1.11.6 Data management**

The 2005, 2010 and 2015 data of the PURE-SA study were archived on hard drives and were locked in a cupboard in an office at the AUTHeR faculty. The data were presented in the form of an Ms Excel and SPSS spread sheets to the student from the project leader Dr IM Kruger. After having been received the data were stored on the computer in the office where the folder of the data as well as the computer were password-protected. After data capturing and analysis the data were deleted from the computer.

#### **1.11.7 Dissemination of research results**

The aim of this study is to give an overview of the trends in violence and injuries in a specific rural community in the North-West Province. These statistics will be given back to the community in the form of a poster. This poster can be displayed in the community clinic and hospital, seeing that violence and injuries is a health problem. The poster will give an overview of violence and injuries in the community and the health risks attached. When the statistics and information are displayed at the clinics and hospital the community members can see how violence and injuries influence one's health and why it should be prevented.

#### **1.12 Role of the members in the research team**

The overall PURE study had a large research team conducting research from a multidisciplinary approach. In the North-West leg of the South African PURE study the principle investigators (PI) were Prof Annamarie Kruger and succeeded by Dr Lanthé Kruger. The various disciplines involved in the PURE study each fulfil their own role in the research they are conducting by

means of the study. In this substudy the fieldworkers were responsible for collecting data in the form of a questionnaire. The PURE administrative assistants were responsible for processing the data on MS Excel sheets and the student was responsible for analysing the violence and injuries data.

### **1.13 Risk benefit ratio**

#### **1.13.1 Risks of the study**

The participants may tire when completing the questionnaire. In order to minimise their discomfort participants were provided with a lunch as well as tea / coffee / juice / water throughout the duration of the day at the seating / waiting area. The option of a short break was also given to keep the participants focused and comfortable. Participants may not want to disclose some information. In the case of unwanted disclosure it was handled by the fact that the participants were not pressurised to disclose information with which they were not comfortable and were also informed that the information they provided was going to be kept confidential. Participants were free to withdraw from the study any time if they did not want to proceed.

#### **1.13.2 Indirect benefits**

Through participating in this study, participants contributed to providing SA with a direct estimate of the health or disease burden, namely statistics on violence and injuries. The research on violence and injuries will also make the community aware of the realities of violence and injuries in their community, and then action can be taken to reduce violence and injuries in the community.

### **1.14 Structure of the dissertation**

Chapter 1: Focused on the overview of the study protocol.

Chapter 2: Presented a synthesis from literature regarding violence and injuries as a global, regional and South African phenomenon with a specific focus on rural areas.

Chapter 3: Manuscript to be submitted for publication in African Safety Promotion titled "Violence and injuries in a South African rural community: A longitudinal study".

Chapter 4: Focus on the recommendations to be made based on the study.

## 1.15 References

- Aschengrau, A. & Seage, G.R. 2014. Essentials of epidemiology in public health. 3<sup>rd</sup>ed. Sudbury, Mass.: Jones & Bartlett Learning.
- Banyard, V.L. 2011. Who will help prevent sexual violence: creating an ecological model of bystander intervention. *Psychology of violence*, 1(3):216-229.
- Bellis, A.B., Hughes, K., Perkins, C. & Bennett, A. 2012. Protecting people, promoting health: a public health approach to violence prevention for England. Liverpool: North West Public Health Observatory.
- Braveman, P., Egerter, S. & Williams, D.R. 2011. The social determinants of health: coming of age. *Annual review of public health*, 21(32):381-398.
- Blalock, C. L. 2014. Labour migration and employment in post-apartheid rural South Africa. University of Colorado, Boulder: (Thesis-PhD).
- Bowman, B., Stevens, G., Eagle, G. & Matzopoulos, R. 2014. Bridging risk and enactment: the role of psychology in leading psychosocial research to augment the public health approach to violence in South Africa. *South African journal of psychology*, 45(3):279-293.
- Catalano, R.F., Fagan, A.A., Gavin, L.E., Greenberg, M.T., Irwin, C.E., Ross, D.A. & Shek, D.T. 2012. Worldwide application of prevention science in adolescent health. *The Lancet*, 379(9826):1653-1664.
- Cicchetti, D. & Lynch, M. 1993. Toward an ecological/transactional model of community violence and child maltreatment: consequences for children's development. *Psychiatry*, 56(1):96-118.
- Cloutier, S., Martin, S.L. & Poole, C. 2002. Sexual assault among North Carolina women: prevalence and health risk factors. *Journal of epidemiology and community health*, 56(4):265-271.
- Cohen, L., Miller, T., Sheppard, M.A., Gordon, E., Gantz, T. and Atnafou, R., 2003. Bridging the gap: bringing together intentional and unintentional injury prevention efforts to improve health and well-being. *Journal of safety research*, 34(5):473-483.
- Corsi, D.J., Subramanian, S., Chow, C.K., McKee, M., Chifamba, J., Dagenais, G., Kruger, A. & Lanasa, F. 2013. Prospective Urban Rural Epidemiology (PURE) study: baseline characteristics

of the household sample and comparative analyses with national data in 17 countries. *American heart journal*, 166(4):636-646.

Crais, C. 2011. *Poverty, war and violence in South Africa*. New York, NY.: Cambridge University Press.

Dahlberg, L.L. & Marcy, J.A. 2009. The history of violence. *AMA virtual mentor*, 11(2):167-172.

De Vos, A., Delpont, C., Fouché, C. & Strydom, H. 2011. *Research at grassroots: a primer for the social science and human professions*. Pretoria: Van Schaik Publishers.

DOH (Department of Health [South Africa]). 2010.

[http://www.nationalplanningcycles.org/sites/default/files/country\\_docs/South%20Africa/south\\_af\\_rica\\_strategic\\_health\\_plan\\_2010-2013.pdf](http://www.nationalplanningcycles.org/sites/default/files/country_docs/South%20Africa/south_af_rica_strategic_health_plan_2010-2013.pdf). Date of Access: 18 Apr. 2016.

Doolan, K., Ehrlich, R. & Myer, L. 2007. Experience of violence and socioeconomic position in South Africa: a national study. *Plos one*, 2(12):e1290.

Elrod, P. and Ryder, R.S., 2013. *Juvenile justice: A social, historical, and legal perspective*. Burlington, MA: Jones & Bartlett Publishers.

El Tayeb, S. 2014. *Injuries in Khartoum State, Sudan. Magnitude, consequences and healthcare utilization: a community-based survey*. Norway, The University of Bergen

Garrib, A., Herbst, A.J., Hosegood, V. & Newell, M.L. 2011. Injury mortality in rural South Africa 2000-2007: rates and associated factors. *Tropical medicine & international health*, 16(4):439-446.

Gass, J.D., Stein, D.J., Williams, D.R. & Seedat, S. 2010. Intimate partner violence, health behaviours, and chronic physical illness among South African women. *South African medical journal*, 100(9):582-585.

Gyedu, A., Nakua, E.K., Otupiri, E., Mock, C., Donkor, P. and Ebel, B., 2014. Incidence, characteristics and risk factors for household and neighbourhood injury among young children in semiurban Ghana: a population-based household survey. *Injury prevention*, 21 (0): e71–e79.

Haegerich, T.M. & Dahlberg, L.L. 2011. Violence as a public health risk. *American journal of lifestyle medicine*, 5:388-389.

Hamilton Health Sciences Corporation & McMaster University. 2007. PURE Protocol. [http://www2.phri.ca/pure/baseline-docs/Protocol\\_International\\_Sep2007.pdf](http://www2.phri.ca/pure/baseline-docs/Protocol_International_Sep2007.pdf) Date of access: 11 Feb. 2016.

Johnson, J.A., Johnson, J.A. III. & Morrow, C.B. 2013. Historical developments in public health and the 21st century. (In Shi, L. & Johnson, J.A. public health administration: principles for population-based management. Burlington, Mass.: Jones & Bartlett Publishers. p. 11-31.)

Kgatla, S.T., 2013. Forced removals and migration: a theology of resistance and liberation in South Africa. *Missionalia*, 41(2), pp.120-132.

Kontis, V., Mathers, C.D., Rehm, J., Stevens, G.A., Shield, K.D., Bonita, R., Ezzati, M. 2014. Contribution of six risk factors to achieving the 25x 25 non-communicable disease mortality reduction target: a modelling study. *The Lancet*, 384(9941):427-437.

Kruger, A. & Kruger, L. 2015. Prospective urban and rural epidemiological study for South Africa (PURE-SA).

Logie, C., Alaggia, R. & Rwigema, M. 2014. A social ecological approach to understanding correlates of lifetime sexual assault among sexual minority women in Toronto, Canada: results from a cross-sectional internet-based survey. *Health education research*, 29(4):671-682.

Mahler, H., Epp, J., Franklin, W. & Kickbusch, I. 1986. Ottawa Charter for Health Promotion. *Health promotion international*, 1(4):405.

Matzopoulos, R., Bowman, B., Mathews, S. & Myers, J. 2010. Applying upstream interventions for interpersonal violence prevention: an uphill struggle in low-to middle-income contexts. *Health policy*, 97(1):62-70

Matzopoulos, R., Prinsloo, M., Wyk, V.P.V., Gwebushe, N., Mathews, S., Martin, L.J., Laubscher, R., Abrahams, N., Msemburi, W., Lombard, C. and Bradshaw, D., 2015. Injury-related mortality in South Africa: a retrospective descriptive study of post-mortem investigations. *Bulletin of the World Health Organization*, 93(5), pp.303-313.

Mayosi, B.M., Flisher, A.J., Lalloo, U.G., Sitas, F., Tollman, S.M. & Bradshaw, D. 2009. The burden of non-communicable diseases in South Africa. *The Lancet*, 374(9693):934-947.

Matzopoulos, R., Prinsloo, M., Wyk, V.P.V., Gwebushe, N., Mathews, S., Martin, L.J., Laubscher, R., Abrahams, N., Msemburi, W., Lombard, C. and Bradshaw, D., 2015. Injury-

related mortality in South Africa: a retrospective descriptive study of postmortem investigations. *Bulletin of the World Health Organization*, 93(5), pp.303-313.

Mayosi, B.M., Lawn, J.E., van Niekerk, A., Bradshaw, D., Karim, S.S.A., Coovadia, H.M. & team, L.S.A. 2012. Health in South Africa: changes and challenges since 2009. *The Lancet*, 380(9858):2029-2043.

McGrath, S.A., Johnson, M. & Miller, M.H. 2012. The social ecological challenges of rural victim advocacy: an exploratory study. *Journal of community psychology*, 40(5):588-606.

Netshitenzhe, J., 2014. Inequality matters: South African trends and interventions. *New agenda: South African journal of social and economic policy*, 53(1).

Neves, D. and Toit, A., 2013. Rural livelihoods in South Africa: Complexity, vulnerability and differentiation. *Journal of agrarian change*, 13(1), pp.93-115.

Noble, M. & Wright, G. 2013. Using indicators of multiple deprivation to demonstrate the spatial legacy of apartheid in South Africa. *Social indicators research*, 112(1):187-201.

Norman, R., Matzopoulos, R., Groenewald, P. & Bradshaw, D. 2007. The high burden of injuries in South Africa. *Bulletin of the World Health Organization*, 85(9):695-702.

Norton, R. & Kobusingye, O. 2013. Injuries. *New England journal of medicine*, 368(18):1723-1730.

Oostra, R.D. 2014. A holistic approach to health: focusing on social determinants promotes wellness and prevents disease. *Healthcare executive*, 29(3):66-67

Otieno, G., Marinda, E., Bärnighausen, T., & Tanser, F. 2015. High rates of homicide in a rural South African population (2000–2008): findings from a population-based cohort study. *Population health metrics*, 13(1):1.

Powell, K.E., Mercy, J.A., Crosby, A.E., Dahlberg, L.L. & Simon, T.R. 2008. Public health models of violence and violence prevention. (In Kurtz, L., ed. *Encyclopaedia of violence, peace, & conflict*. Oxford: Elsevier. p. 175-187.)

Rapp, D., Zoch, B., Khan, M.M.H., Pollmann, T. and Krämer, A., 2012. Association between gap in spousal education and domestic violence in India and Bangladesh. *BMC public health*, 12(1), p.1.

Rockett, I.R., Regier, M.D., Kapusta, N.D., Coben, J.H., Miller, T.R., Hanzlick, R.L., Todd, K.H., Sattin, R.W., Kennedy, L.W., Kleinig, J. and Smith, G.S., 2012. Leading causes of unintentional and intentional injury mortality: United States, 2000–2009. *American journal of public health*, 102(11), pp.e84-e92.

Santaularia, J., Johnson, M., Hart, L., Haskett, L., Welsh, E. & Faseru, B. 2014. Relationships between sexual violence and chronic disease: a cross-sectional study. *BMC public health*, 14(1):1.

Seedat, M., Van Niekerk, A., Jewkes, R., Suffla, S. & Ratele, K. 2009. Violence and injuries in South Africa: prioritising an agenda for prevention. *The Lancet*, 374(9694):1011-1022.

Strandberg, E.L., Ovhed, I., Borgquist, L. & Wilhelmsson, S. 2007. The perceived meaning of a (w) holistic view among general practitioners and district nurses in Swedish primary care: a qualitative study. *BMC family practice*, 8(1):1.

Teo, K., Chow, C.K., Vaz, M., Rangarajan, S. & Yusuf, S. 2009. The Prospective Urban Rural Epidemiology (PURE) study: examining the impact of societal influences on chronic non communicable diseases in low-, middle-, and high-income countries. *American heart journal*, 158(1):1-7. e1.

Tulchinsky, T. & Varavikova, E. 2014. *The new public health*. 3<sup>rd</sup>ed. London: Elsevier

Van Niekerk, A., Suffla, S. and Seedat, M., 2008. Crime, violence and injury prevention in South Africa: data to action. *Medical Research Council*, University of South Africa.

World Health Organization. 2014a. Global status report on violence prevention 2014. Genève: World Health Organization.

World Health Organization. 2015b. Health and development. Geneva: WHO. <http://www.who.int/hdp/en/> Date of access: 29 Jun. 2015.

Winersjö, R., Ponce de Leon, A., Soares, J.F. & Macassa, G. 2012. Violence and self-reported health: does individual socioeconomic position matter? *Journal of injury and violence research*, 4(2):87-95

## **CHAPTER 2: A LITERATURE REVIEW ON VIOLENCE AND INJURIES IN RURAL COMMUNITIES**

### **2.1 Introduction**

To visualise a less violent and injured world, there must first be an understanding of how violent and injured the world is (Reza *et al.*, 2001:104). As indicated in Chapter one, the reality of violence and injuries is a common global phenomenon and a public health problem (Haegerich & Dahlberg, 2011:392; Rutherford, 2008:500). This is especially prominent in SA where violence and injuries are ranked as the second leading cause of death and lost disability-adjusted life years (DALYs) (Norman *et al.*, 2007:696; Seedat *et al.*, 2009:1011). Violence and injuries are two different concepts but have the same consequences. By using the socio-ecological model as a conceptual framework to outline the risk factors and management of violence and injuries, this chapter presents a synthesis from literature regarding violence and injuries as a global, regional and South African phenomenon with a specific focus on rural areas.

### **2.2 Typology of violence**

To understand violence and injuries in a way assisting prevention interventions, the typology of violence by Krug *et al.* (2002:1084) served as framework for discussion (see Figure 2.1). The typology is best understood as a matrix with the four areas of violence namely: physical; sexual; psychological attack and deprivation. Within these four areas of violence there are different categories of inflicted violence according to the victim-perpetrator relationship, namely self-directed violence, interpersonal violence and collective violence. Self-directed violence refers to violence a person inflicts upon himself whereas interpersonal violence is inflicted by another individual or by a small group of individuals. Collective violence is when violence is inflicted by larger groups such as governments, organised political groups, the military and organised crime.

Each of these categories is further divided to reflect more specific types of violence (Butchart, 2006:65; Krug *et al.*, 2002:1084; WHO, 2015) and will be discussed hereafter. Despite rampant prevalence of violence in various forms, there is a lack of global consensus on a unified definition. This incongruent understanding is highlighted considering that violence has been an integral part of human life, since its existence (Kim, 2012:240, King, 2012:239, Konner, 2006:1). A scientific understanding of human violence is one of the most urgent tasks of the twenty-first century (De Haan, 2008:27). The realities of violence occur daily in streets, homes, schools, workplaces and are reported extensively in the media (Nel, 2006:1; WHO, 2014:iv). Still among

academics there is no agreement concerning a definition of what exactly 'violence' is (De Haan, 2008:27; Krause, 2009:337).

Definitions of violence range from the use of physical force to harm someone, and to damage property, etc. (Merriam Webster's medical dictionary, 2015; Oxford dictionaries, 2016) to considering the criminal use of force prohibited by law (Riedel & Welsh, 2002). In this research the definition from the WHO (2015) is supported, namely "*the intentional use of physical force or power threatened or actual, against oneself, another person or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development or deprivation*". Such power or force may be used against oneself, against an individual or against a group or community, as in gang violence or repression of ethnic groups (Rutherford *et al.*, 2007:676). Violence can be described as the action with an associated outcome, such as injuries.

### **2.2.1 Self-inflicted violence**

Self-inflicted violence refers to anything a person does intentionally causing injury and even death to self; such as self-abuse, self-mutilation and suicide (CDC, 2016; WHO, 2014d:2). Suicidal behaviour ranges in degree from merely thinking about ending one's life, to planning it, finding the means to do so, attempting to kill oneself and completing the act (Schrijvers *et al.*, 2012:20; WHO, 2002:5). Suicidal data are too insufficient and unreliable (Värnik, 2012:761) to truly understand the status of suicide globally. However, these should not be seen as different points on a single continuum. Many people who entertain suicidal thoughts never act on them, and even those who attempt suicide may have no intention of dying (WHO, 2002:5). In a study that was conducted in rural China by Zhao & Zhang (2014:131), it was revealed that young adults aged 25 to 34 years are at heightened risk of suicide and this among other factors was attributed to experiencing more psychological strains with age, marital status, physical health, and personal income.

The other form of self-directed violence is self-abuse. This refers to people who repeatedly injure themselves by cutting, burning or damaging their skin and its underlying tissue (Huband & Tantam, 2009:2). People exposed to a variety of stressful events or circumstances are at increased risk of harming themselves (Rayner & Warne, 2016:55). These stressful events can include the loss of loved ones, interpersonal conflicts with family or friends and legal or work-related problems (Edmondson *et al.*, 2016:112). According to Banerjee *et al.* (2013:4) self-abuse in India is also a problem in rural areas, with a prevalence of 9.9% and the most commonly reported cause for self-abuse is a dispute with family members or the spouse.

## 2.2.2 Interpersonal

Interpersonal violence occurs when one person uses power and control over another through physical, sexual or emotional threats or actions, economic control, isolation or other kinds of coercive behaviour (Midei & Matthews, 2011:1; WHO, 2014d:2). Acts of interpersonal violence are classified into two broad categories i.e. family violence and community violence (WHO, 2002:7). Family violence can be defined as any act of mistreatment by individuals who are cohabitating or living together as a family and include child abuse, violence by an intimate partner and abuse of the elderly. It can also refer to violence mostly between family members and intimate partners, taking place in the home (WHO, 2002:5). Therefore family violence can result in serious injuries among members of the family (Wallace & Roberson, 2015:4). Family violence can present in different forms, such as:

- Physical abuse: the intentional use of force against a person without that person's consent. It can cause physical pain or injury that may last for a long time. For example hitting, kicking, choking, stabbing or throwing objects at someone etc. (Breiding *et al.*, 2015:11). The prevalence of physical abuse in China is approximately 36.6% (Ji & Finkelhor, 2015:61). According to Zhao *et al.* (2014:665) the number of rural Chinese children who are left behind as a result of rural to urban migration has significantly increased over the past decade and these children experience higher levels of physical abuse compared to those who are not left behind.
- Sexual abuse includes sexual touching or sexual activity without consent, continued sexual contact when asked to stop and forcing someone to commit unsafe or humiliating sexual acts. Even when married, a spouse cannot be forced to have sexual contact (Breiding *et al.*, 2015:11). In an India-based study by Singh *et al.* (2016:6), it was reported that women in particular are at heightened risk of experiencing sexual abuse at their workplace, in the community or through exploitation by the police. According to Stephenson *et al.* (2013:1140) approximately 39.3% of women in the rural areas in India have experienced sexual abuse.
- Financial abuse happens when someone uses money or property to control or exploit someone else. It can involve taking money or property without permission, having control by withholding or limiting money, pressuring someone to sign documents and forcing someone to sell things or change a will (Stylianou *et al.*, 2013:3186). In rural China financial abuse among the elderly is a common phenomenon. According to Wu *et al.* (2012:1), the prevalence of elderly people in rural areas who are financially abused is approximately 14.2%.

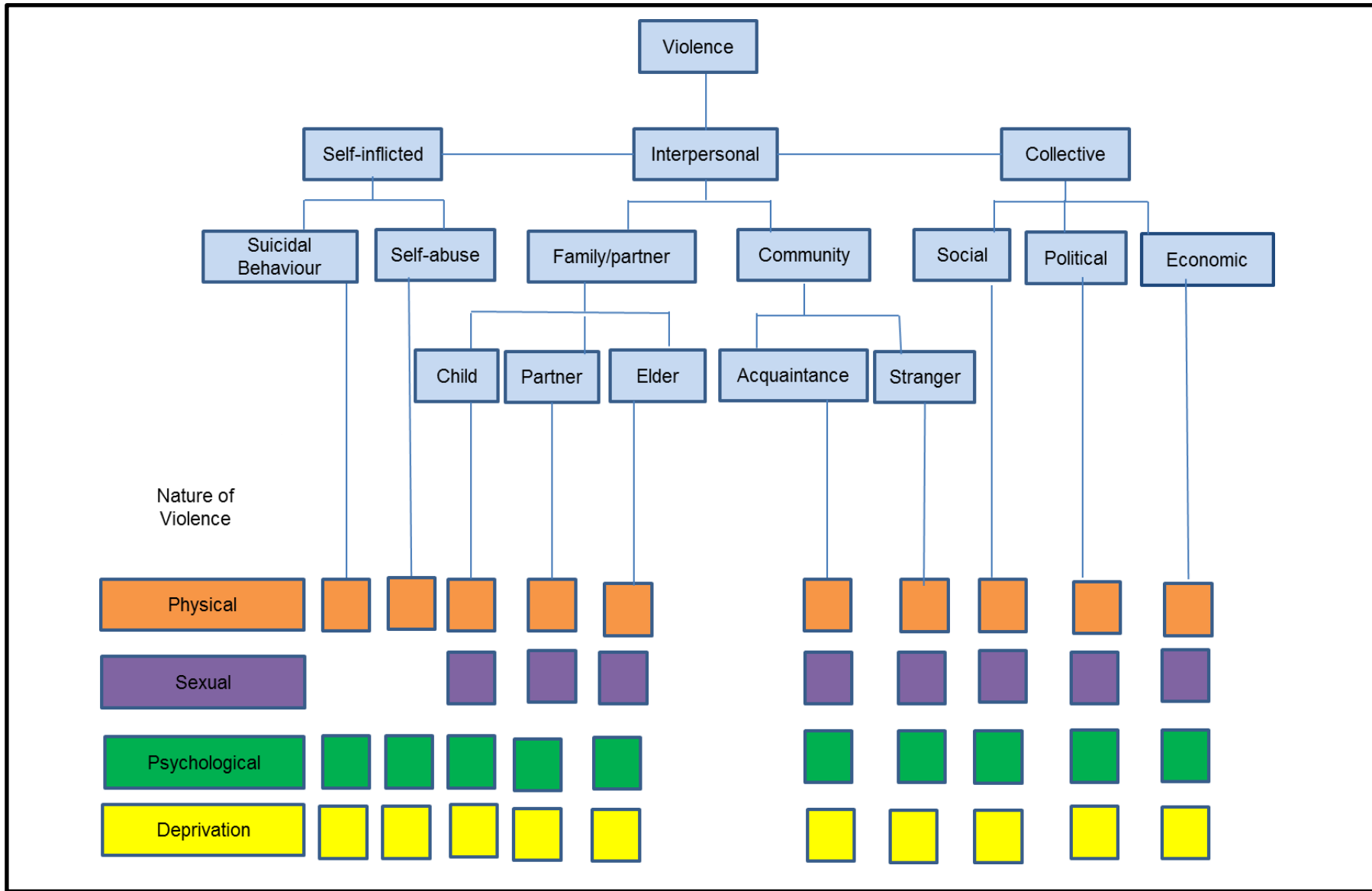


Figure 2-1: Typology of violence (Krug *et al.*, 2002:1084)

- Emotional abuse happens when a person uses words or actions to control, frighten or isolate someone or take away their self-respect (Kumagai & Ishii-Kuntz, 2016:4). It can include threats, put-downs, name-calling or insults, constant yelling or criticism, controlling or keeping someone from seeing friends or family, making fun of or preventing someone from practicing their faith or religion, destroying belongings, hurting pets or threatening to do so (Pain, 2014:532). Wu *et al.* (2012:1) also add that emotional abuse is also common among the elderly in rural areas of China, with a prevalence of approximately 27.3%.
- Neglect happens when a family member, who has a duty to care for someone, fails to provide them with basic needs. This can involve: not providing proper food or warm clothing, failing to provide adequate health care, medication and personal hygiene (if needed), failing to prevent physical harm, failing to ensure proper supervision (if needed). Spouses and common-law partners have a duty to care for each other. Adults have a duty to care for their dependent children as well as their dependent parents (Eastman, 2013:5; Kumagai & Ishii-Kuntz, 2016:4; Widom *et al.*, 2014:651).

Community violence entails youth violence, random acts of violence, rape or sexual assault by strangers, and violence in institutional settings such as schools, workplaces, prisons and nursing homes (Hughes *et al.*, 2014:656; WHO, 2002:5). It signifies violent acts between individuals or groups experienced outside the home, such as threatening, beating, robbing, mugging, raping, shooting, stabbing or killing (Löfving–Gupta *et al.*, 2015:539; WHO, 2002:5). Community violence can be experienced directly or indirectly. Direct exposure implies being a victim or a target of violence whereas indirect exposure means to be at the scene of violence and directly witnessing it (Javdani *et al.*, 2014:235; Löfving–Gupta *et al.*, 2015:539). The prevalence of community violence tends to vary dramatically depending on the geographical location, with higher rates of exposure to community violence, in low-income and ethnic minority communities (Löfving–Gupta *et al.*, 2015:539). Mkhize *et al.* (2012:38) explored the impact of community violence on learners in a rural area in SA and reported a high prevalence of community violence. They also noted a connection between exposure to community violence and psychological disorders.

### **2.2.3 Collective violence**

Collective violence refers to probable motives for violence committed by people who identify themselves as members of a group against another group or set of individuals, in order to achieve political, economic or social goals (Durrant, 2011:429; WHO, 2002:5). Unlike the other two broad categories, the subcategories of collective violence suggest possible motives for violence committed by larger groups of individuals or by countries (Tilly, 2003:16) and present as social, political and economic violence.

Social violence is committed to advance a particular social agenda. This includes crimes of hate committed by organised groups, terrorist acts and mob violence. These acts are a deliberate use or threat of brutal violence by subnational groups to obtain a political, religious, or ideological objective through intimidation of a large audience (Lizardo, 2015:93). China is facing escalating incidences of social unrest in the rural area (Zhou & Banik, 2014:255). This among other factors has been attributed to land disputes (Zhou & Banik, 2014:255).

Political violence refers to violence outside of state control that is politically motivated (Eager, 2016:2). Goodwin (2012:3) refers to political violence as part of “contentious politics” or collective political struggle that not only includes things like revolutions, civil war, riots and strikes, but also more peaceful protest movements. The transition to a democratic SA in itself was a significant example of a protracted liberation struggle, characterised by political violence and state-sponsored oppression that ended only in 1994 (Atwoli *et al.*, 2013:1). However the rest of Africa has seen a particularly pronounced emergence of political intimidation and violence during election time, some examples of elections marked by thousands of deaths in the recent years (Collier & Vicente, 2014:2). SA has the highest inequality in the world with approximately 53% of the population living in poverty (Gradín, 2013:22).

Economic violence is a type of violence committed by individuals or groups preying on economically disadvantaged individuals (WHO, 2002:5). This includes attacks carried out with the purpose of disrupting economic activity, denying access to essential services, or creating economic division (Higginson *et al.*, 2013:8; WHO, 2002:5). Examples of economic violence include: human trafficking for sex purposes, extensive drug-related violence perpetrated by large organised drug gangs and undocumented workers. In Brazil the trends in economic violence are changing. Recently rural areas have been experiencing an increase in the incidence of economic violence compared to urban areas (Steeves *et al.*, 2015:360). This has been due to a stagnant economic growth in rural areas.

### **2.3 Typology of injuries**

Injuries have traditionally been defined as the physical damage to a person caused by an acute transfer of energy (mechanical, thermal, electrical, chemical, or radiation energy) or by the sudden absence of heat or oxygen (Krug *et al.*, 2000:523). This definition has been broadened to include emotional injuries for example psychological harm, maldevelopment or deprivation (Norton & Kobusingye, 2013:1723). Injuries can be presented as bodily lesion or psychological harm due to acute exposure to energy in amounts that exceed the threshold of physiological tolerance, or it can be an impairment of function resulting from a lack of one or more vital elements (Holder *et al.*, 2002:5).

Injuries are most commonly categorised with reference to the presumed underlying intent (Norton & Kobusingye, 2013:1723). Injuries considered to be unintentional include those caused by road-traffic incidents, falls, drowning, burns, and poisonings (Norton & Kobusingye, 2013:1723). Intentional injuries also referred to as violence by many researchers (Hammer *et al.*, 2013:32; Krug *et al.*, 2000:523; Rockett *et al.*, 2012:84) include injuries caused by self-harm, interpersonal violence, and war and conflict (Norton & Kobusingye, 2013:1723). Whether an injury has occurred from violence or an unintended cause is not always clear. In these situations, the injury is classified as being of undetermined intent. However, for legal or social reasons it is classified as unintentional injury (Merson *et al.*, 2012:407).

The five leading causes of injury deaths comprise three unintentional (motor vehicle traffic crashes, poisoning, and falls) and two violence-related categories (suicide and homicide) (Rockett *et al.*, 2012:84). According to Sethi (2006:ix) tackling unintentional injuries and violence together offers numerous advantages, because the care of the victims requires similar health services and leads to similar consequences for example disability, psychological trauma and death. Globally injuries are a serious epidemic, resulting in more than 5 million deaths annually, equalling the fatalities from HIV, malaria and tuberculosis combined (WHO, 2014a:2). Injuries are a public health problem in India. Gosavi *et al.* (2014:380) conducted a study to explore the epidemiology of injuries in a rural area in India. They reported that the majority of injuries (94%) were unintentional whereas assault and suicide-linked injuries were 4.1% and 1.1% respectively.

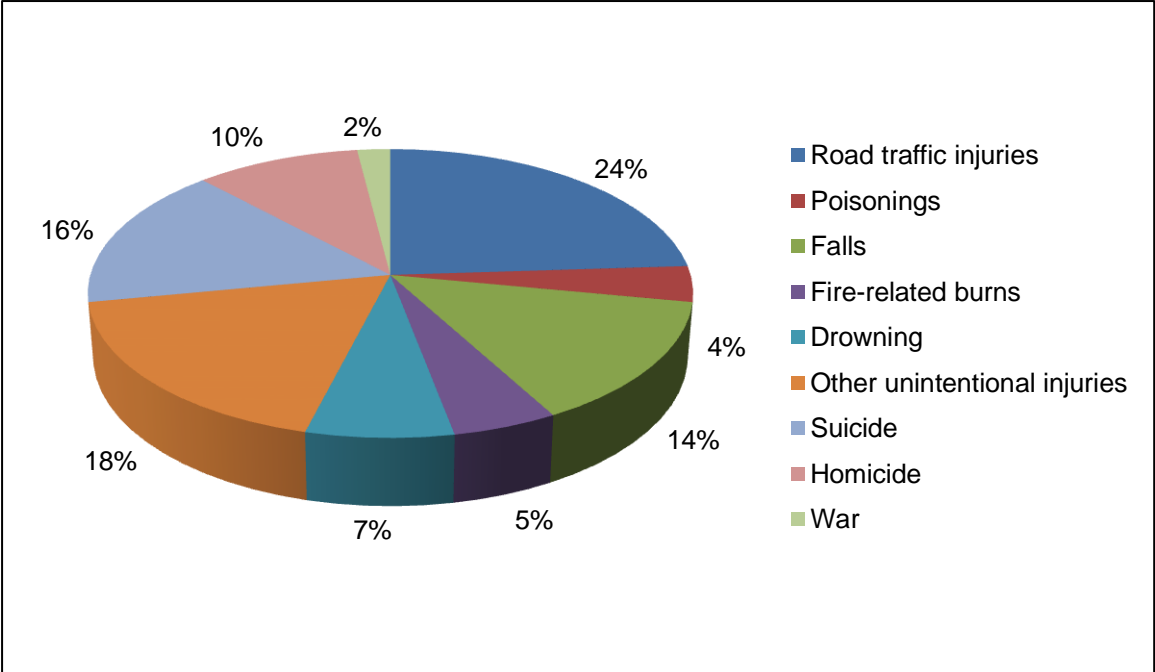
### **2.3.1 Fatal injuries**

A fatal injury means an injury resulting in the death of the injured person. According to Cardona *et al.* (2008:232), in rural India the leading causes of fatal injury were self-harm (36%), falls (20%), and road traffic accidents (13%). People in low- and middle-income countries (LMIC) like SA are more likely to suffer a disproportionate number of injury-related deaths. According to Garrib *et al.* (2011:439) homicide, road traffic injuries and suicide were the major causes of fatal injuries in rural areas in SA. In general the total number of injury related-deaths in SA stand at 89%, compared with 84% of deaths from all causes (Norton & Kobusingye, 2013:1723; Tulchinsky & Varavikova, 2014:279). This implies that SA is contributing quite a substantial portion to the overall global injury statistics. Figure 3 shows the global statistics on injuries published by the WHO in 2012.

### **2.3.2 Non-fatal**

For each death from injury there are many more injuries that result in hospitalisation, treatment in emergency departments, treatment by general practitioners or other health personnel, or no

treatment at all (Krug *et al.*, 2000:523). In many cases these injuries cause permanent disability. Non-fatal injury is mostly calculated by disability-adjusted life years (DALY's). DALY's combine the number of years of life lost from premature death with the loss of health from disability among persons with non-fatal injuries. One DALY is one year lost in healthy life (Krug *et al.*, 2000:523; Polinder *et al.*, 2012:17). According to Dandona *et al.* (2010:66), the annual incidence of non-fatal fall-related injury in rural India was 3.30% and 9.22% for men and women respectively. They also reported a connection between the incidence of such injuries and the incidence of increase in age.



**Figure 2-2: Global statistics on injury-related deaths (WHO, 2014a:2)**

**2.4 Violence and injuries: a deliberate combination**

In the previous paragraphs of this chapter the researcher presented violence and injuries within rural communities as two separate concepts. The rationale thereof was to position these two concepts clearly. Yet, violence and injuries within rural communities are grouped together (see Chapter one general introduction) throughout this research.

**2.5 Epidemiology of violence and injuries**

To appreciate the different forms of violence and injuries that may be occurring within rural communities, it is paramount to understand the proportions of violence and injuries in general and in specific subgroups of the population. An understanding of the principles of epidemiology with specific reference to violence and injuries is very important.

The first report on global statistics on violence and injuries was the WHO report on violence and health published in 2002 (Krug *et al.*, 2002:1083). Annually intentional and unintentional injuries account for nearly 1 in every 10 deaths worldwide (Hofman *et al.*, 2005:13). According to the WHO (2014d:2) violence and injuries result in more than 1.3 million deaths annually, making violence and injuries the fourth leading cause of death worldwide. This number excludes victims of assault who sustain physical, sexual and psychological abuse, and do not bring it to the attention of health or other authorities (WHO, 2014d:2). The magnitude of the problem is best represented by the worst result of violent behaviour (homicide) recorded in official statistics. The following table reflects rates of homicide per 100 000 population, by the WHO region and country income status, 2014.

**Table 2-1: Estimated rates of homicide per 100 000 populations (WHO, 2014d:8)**

<b>WHO region and country income level</b>	<b>Number of homicides</b>	<b>Homicide rate per 100 000 population</b>
African region low- and middle- income	980 81	10.9
Region of Americas, low- and middle-income	165 617	28.5
Eastern Mediterranean region, low- and middle-income	384 47	7.0
European region, low- and middle-income	102 77	3.8
South-East Asia region, low- and middle-income	783 31	4.3
Western Pacific region, low- and middle-income	343 28	2.1
All regions high-income	482 45	3.8
Global	474 937	5.7

Homicide is the second highest in the African region. However SA alone has the highest homicide rate in the world (Thomson, 2016:7) and a recent study by Otieno *et al.* (2015:1) reported an increase in homicide-related violence particularly in rural areas. This implies violence in rural SA is also significantly contributing to the violence statistics in Africa. In the southern region of Asia, Indian homicide has become a common practice in the rural areas (Mohanty *et al.*, 2013:18). Low socioeconomic status and literacy have been associated with the high homicide rate in the rural areas (Mohanty *et al.*, 2013:18). It is quite unfortunate that normally the majority of the victims are innocent civilians with no history of violence. Amongst

high income countries, Russia has been facing an increase in the homicide rate particularly in the rural areas (Lysova *et al.*, 2012:451). This has been attributed to many years of social, economic, and political turmoil experienced in the country in the 90's (Lysova *et al.*, 2012:451).

The estimated rates of homicide only reflect a fraction of the overall impact of violence on global health and development (Matzopoulos *et al.*, 2010a:1). Not every act of violence or injury results in death, but there are several survivors with permanent disabling outcomes (Norman *et al.*, 2007:695). In 2010 interpersonal violence was ranked 27<sup>th</sup> across causes for and disability-adjusted life-year (DALY's) at global level (Institute for health metrics and evaluation, 2016:2; Murray *et al.*, 2013a:2218). Violence and injuries collectively caused 11,2% of DALY's in 2010 with road injuries accounting for 27% of the injury total, followed by self-harm (15%), falls (14%) and interpersonal violence (10%) (Murray *et al.*, 2013a:2203).

A lack of reliable statistics obscures the health and development impacts of injuries and violence particularly in developing countries (WHO, 2014d:21). This shows that international recognition of and assistance for injury control efforts are well below the levels directed at other health problems (Norman *et al.*, 2007:695).

### **2.5.1 Sub-Saharan perspective**

In the rural communities of Sub-Saharan Africa, women are at heightened risk of intimate partner violence. According to Deyassa *et al.* (2010:1) there is a connection between illiteracy and the occurrence of intimate partner violence in rural areas. Sievert (2015:3) also did a study on violence in Sub-Saharan Africa, and reported that access and higher exposure to information via television sets causes a difference in IPV acceptance. The author concluded that improvement of rural infrastructure through electrification might possibly assist in eliminating intimate partner violence in rural areas. Unintentional injuries are also a major public health problem in Sub-Saharan Africa. According to Albertyn *et al.* (2014:61), the highest number of paediatric burn admissions in the world is occurring in rural Sub-Saharan Africa. Every year approximately 18 000 to 30 000 children below the age of 5 years in this region die of burn injuries (Albertyn *et al.*, 2014:61).

According to Ayuurebobi *et al.* (2012:1) unintentional injuries (burns, drowning, road traffic accidents) and homicide are the major causes of injury and mortality in rural Sub-Saharan Africa. Chasimpha *et al.* (2015:1) explored the patterns and mortality risk factors from external causes in Malawi and also reported that drowning, road traffic injuries and suicide were the leading external causes particularly in rural areas. The WHO (2013a:5) also adds that despite the region being the least motorised, it has the highest road traffic mortality rate in the world, proportional to its population. An estimated 24.1 people per 100 000 of the population are killed

in road accidents each year (WHO, 2013a:5). Just seven countries account for almost 64% of all road deaths in the region (Democratic Republic of Congo, Ethiopia, Kenya, Nigeria, South Africa, Tanzania, and Uganda), with Nigeria and South Africa having the highest fatality rates (33.7 and 31.9 deaths per 100 000 per year respectively) (Marquez & Farrington, 2013:18).

### **2.5.2 South African perspective**

SA, a country not at war, faces an unprecedented burden of morbidity and mortality arising from violence and injuries (Seedat *et al.*, 2009:1011), with rates of interpersonal violence that are four and a half times the worldwide percentage (Norman *et al.*, 2010:11; Seedat *et al.*, 2009:1011). In 2008 violence and injuries accounted for almost 50% of all injury deaths in SA, as recorded by the National Injury Mortality Surveillance System (NIMSS, 2008:5). According to the statistics of Mortality and causes of death in SA, 2013: Violence and injuries 10,3% of all deaths were due to external causes of morbidity and mortality. It was observed that the majority of non-natural causes of death resulted from other external causes of accidental injury (56,4% of non-natural deaths and 5,8% of all deaths). Event of undetermined intent was the second most common non-natural cause of death, accounting for 16,0% of non-natural causes and 1,6% of all deaths. The third most common cause of non-natural deaths was transport accidents (12,1%), followed by assault (10,6%) (Statistics South Africa, 2014:27).

According to Otieno *et al.* (2015:1), SA is facing an increase in its homicide rate particularly in the rural areas. Socioeconomic status, place of residency, age and level of education are the major determinants of homicide in the rural areas in SA (Otieno *et al.*, 2015:1). Garrib *et al.* (2011:439) explored the injury mortality rate in rural SA. The authors reported that homicide, road traffic injuries (RTI's) and suicide were the major causes of mortality in the rural areas in SA. Swart *et al.* (2012:28) compared the differences in child injury mortality between urban and rural areas in SA. The study revealed that motor vehicle-related mortality was more evident among children in rural areas than among their urban counterparts.

In the case of health hazards for farm workers in rural areas, a study documented that South African farm worker injury rates are higher than those in most other occupational sectors (London, 2013:60). This difference was attributed to the different environmental and infrastructure-related disparities that exist between urban and rural areas. There is a need for intersectional primary prevention efforts that address the causes of violence and injuries in rural areas (Garrib *et al.* 2011:439).

## **2.6 Socio-ecological model as conceptual framework**

Violence and injuries have many faces, some of which are highly visible and others which are unknown. Understanding the causes and risk factors of violence and injuries is best explained in

the form of the socio-ecological model for understanding the interdependent risk factors of violence and injuries presented by the WHO 2002 World report on violence and health (WHO, 2002:12).

The proliferation of contemporary ecological models is based on a rich conceptual tradition in the behavioural and social sciences (Sallis *et al.*, 2008:467). Bronfenbrenner argued that in order to understand human development one must consider the entire ecological system in which growth occurs. The Bronfenbrenner's social-ecological model was first introduced in the 1970's (Bronfenbrenner, 1994:37). Years along the line research suggested that while biological and other individual factors explain one's predisposition to aggression, these factors are often influenced by other factors like family, community and cultural differences to create a situation where violence and injuries are more likely to occur (Boxer *et al.*, 2013:163; Dahlberg & Krug, 2002:3; Michau *et al.*, 2015:1672).

In 2002 the WHO used the ecological framework to highlight the multiple causes of violence and injuries along with the interaction of risk factors operating within the family and broader community, social, cultural and economic contexts. Since then the social-ecological model is widely used in violence research and literature (Banyard, 2011:216; Bowman *et al.*, 2014:283; Cicchetti & Lynch, 1993:97; Dahlberg & Krug, 2002:12; Logie *et al.*, 2014:4; Powell *et al.*, 2008:1816) and is still relevant today 15 years later. This model consists of four levels illustrating the interaction between risk factors of violence at the individual, relationship, community and societal levels, each focusing on a different aspect of human life (Bellis *et al.*, 2012:27).

The 'Individual'-level of the social-ecological model addresses biological and personal characteristics that may influence injury-related behaviour. The 'Relationship'-level addresses the influence that close interpersonal relationships such as those with family members, peers, caregivers, and intimate partners have on the occurrence of violence. The 'Community'-level focuses on the characteristics of communities or settings within communities that may create conditions that increase or decrease the risk of violence. The 'Societal'-level encompasses the influence of broad cultural, social, and economic factors on the risk of violence and its prevention (Powell *et al.*, 2008:1816). The interaction between individual factors and the broader social, cultural and economic contexts suggests that addressing risk factors across the various levels of the social-ecological model may contribute to a decrease in violence (Dahlberg & Krug, 2002:15).

Although 30 years ago the words "violence" and "health" were rarely used in the same sentence, there is an increasing recognition of the public health importance of violence and injuries (Dahlberg & Marcy, 2009:167; Wolf *et al.*, 2014:220). It is currently among the top

twenty causes of worldwide loss of disability adjusted living years, and projected to increase in importance by 2030 (Wolf *et al.*, 2014:220). There is no single factor that explains why some individuals behave violently toward others or why violence is more prevalent in some communities than in others. Violence is the result of the complex interplay of individual, relationship, social, cultural and environmental factors. Understanding how these factors are related to violence and injuries is one of the important steps in the public health approach to preventing violence (WHO, 2002:9).

### **2.6.1 Violence and injuries in rural areas on an individual level**

Personal history and biological factors influence how individuals behave and increase their likelihood of becoming victims or perpetrators of violence. This history is characterised as the individual level risk factors for violence and injuries (Shihadi, 2015:114). Among these factors are age, gender personality disorders, alcohol and/or substance abuse and a history of behaving aggressively or having experienced abuse.

#### 2.6.1.1 Risk factors

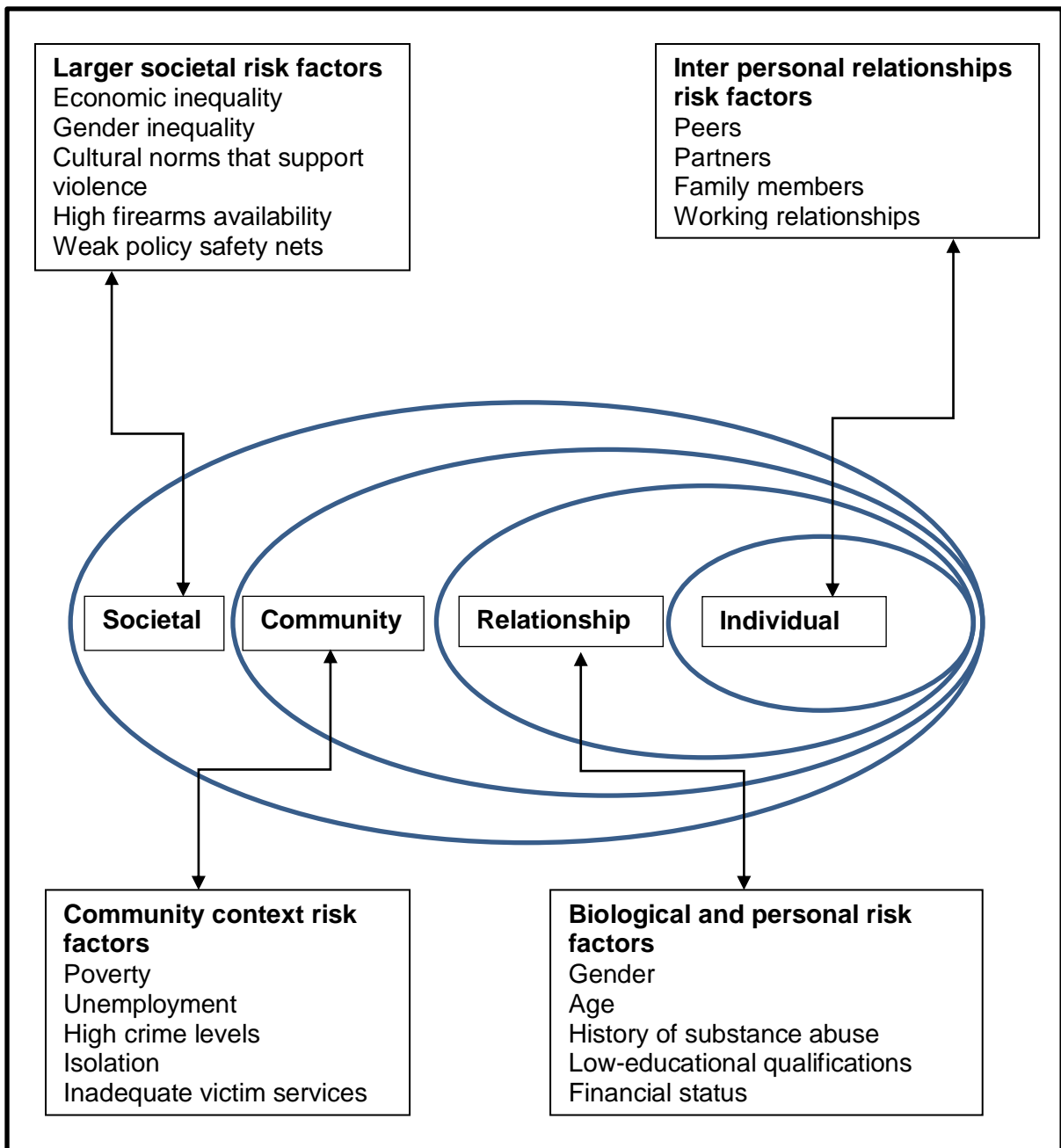
The risks factors for violence and injuries can be viewed in two categories: firstly risk factors of being a victim of violence and injuries and secondly risk factors of being a perpetrator of violence and injuries. Although it can be viewed in two ways the same risk factors apply (Butchart, 2006:68).

##### 2.6.1.1.1 Risk factors for being a victim of violence and injuries in a rural area

The first level of the socio-ecological model focuses on the individual characteristics that can contribute to being a victim of violence and injuries. These characteristics include age, gender race and educational status.

#### *Age and gender*

According to the WHO the risk factor of becoming a victim of violence and injuries peaks at age 15–44 years (WHO, 2014:9). In the year 2000 SA's homicide rates peaked for males at the age of 15–29 with a total of 184 per 100 000, nine times the global. Homicide rates for women peaked in the 30–44 age group at 31.7 per 100 000. While much lower than for men, this was seven times the global rate (Norman *et al.*, 2010:2). Road traffic age-specific mortality rates were about double the global rate for both sexes, peaking at 2.5 times the global rate for adult women aged 30–44.



**Figure 2-3: Social ecological model for understanding the risk factors associated with violence (and injuries)** (Powell *et al.*, 2008:1816)

Suicide rates were higher than the global average in males but lower in females. Injuries were responsible for an estimated 2.3 million DALY's; the male burden was three times higher than the female (Norman *et al.*, 2007:697).

Males are disproportionately represented among victims of violent death and physical injuries treated in emergency departments (WHO, 2014:8). However, violence and injuries against women are particularly prone to underreporting. Population-based surveys of intimate partner violence against women show that 20% to 60% of women have told no one about the violence and few have sought institutional help, including from health care services (WHO, 2014d:13).

Early marriage (or cohabitation) jeopardises a woman's social status, as she is likely to find motherhood the sole focus of her life and is denied opportunities for formal education and training for employment (Naved & Persson, 2005:289). This can affect women emotionally resulting in communication breakdown and ultimately violence. Continuing well into elder abuse as evidence suggests that the majority of older people who are victims of physical, sexual or financial abuse are long-term victims of abuse, often perpetrated by a partner who is in a duty of care relationship with the victim (Morgan & Chadwick, 2009:5).

#### *Low-educational qualifications*

In some studies, high educational attainment among women was associated with low levels of violence (Abramsky *et al.*, 2011:4). The same finding has been noted for men. Education promotes social empowerment through social networks, and self-confidence. It also encourages the ability to use information and resources available in society (Jewkes, 2002:1424; Simister, 2010:248). Educated women are typically more autonomous; therefore, they possess the resources necessary better to recognise and terminate a potentially abusive relationship (Flake, 2005:357).

#### *Financial status*

Research demonstrates the intersection of financial/economic factors and victims of violence and injuries in various ways, for example: Partners that do not have their own income or little income are vulnerable to abuse. They are often prevented from leaving an abusive partner due to economic dependence and their inability to obtain or maintain employment is significantly associated with and affected by intimate partner violence (Hindin & Adair, 2002:1386; Sanders, 2015:4).

#### *History of substance abuse*

The relationship between substance abuse and violence and injuries is complex (Choo *et al.*, 2014:1447). In the case of intimate partner violence the victim may drink alcohol to cope with the sequel of abuse, but conversely the victim's consumption of alcohol or other substances may result in abuse from their partners for example when their partners believe they should not drink (García-Moreno, 2013:24). In another situation people who abuse alcohol and substances are more vulnerable to become victims of violence and injuries (Jewkes *et al.*, 2015:2; Kilpatrick *et al.*, 1997:834).

#### 2.6.1.1.2 Risk factors for being a perpetrator of violence and injuries

The same individual characteristics that can make a person a victim of violence and injuries can contribute to being a perpetrator of violence. Personal history and biological factors influence individuals' behaviour and increase their likelihood of becoming perpetrators of violence (Shihadi, 2015:114).

##### *Age and gender*

While there is no definite age for perpetrators of violence and injuries, age is likely to play a role when one commits such crimes. Approximately one third of all convicted rapists are under the age of 25 and almost one fifth of all sexual assault perpetrators are 18-21 years of age (Futures Without Violence, 2016:2). Age is a very important factor in being a perpetrator of violence and injuries. Various studies indicate that the children witnessing violence while growing up tend to be perpetrators in their adulthood (Shaffer & Ruback, 2002:2; Stith *et al.*, 2000; WHO, 2002). Studies have also shown that gender itself is a risk factor of being a perpetrator of violence and injuries. Males appear to be much more likely to engage in serious violence than females, possibly because boys are socialised into roles that encourage higher levels of physical aggression (Herrenkohl *et al.*, 2000:177).

##### *Low educational qualifications*

Other than young age, low income, lack of health insurance, low educational attainment was also associated with physical violence among perpetrators (Vest *et al.*, 2002:160). Prison statistics in Brazil indicated most prisoners had low educational qualifications: 63% had completed less than 10 years of education (Murray *et al.*, 2013c:477).

##### *Financial status*

Studies also suggest that, for men, violence is one means of establishing traditional masculinity. When men lack access to economic resources and employment, they may use violence in an attempt to re-establish their power at home (Sanders, 2015:6). Men trapped in rural areas with neither employment, nor a model of masculine success reshapes the idea of masculinity by emphasising misogyny, substance use, and participation in violence. Violence against women becomes a social norm in which men are violent towards women they can no longer control or economically support (Jewkes, 2002:1426).

##### *History of substance abuse*

National surveys report that male drinking patterns are more likely than those of females to incorporate binge drinking with aggressive behaviour, and that violent behaviour while under the influence of alcohol is very rare among females (Boles & Miotto, 2003:157; García-Moreno,

2013:24). Some researchers have noted that alcohol may act as a cultural “time-out” for antisocial behaviour. Thus, men are more likely to act violently when drunk because they do not feel they will be held accountable for their behaviour (Jewkes, 2002:1426). Although developmental factors with substance abuse can also be predictive of adult violence, early childhood aggression is a predictor of later heavy drinking, and the combination is associated with above average risk of adult violent behaviour (Boles & Miotto, 2003:157).

#### 2.6.1.2 Consequences and outcomes of violence and injuries on an individual level

The direct consequences of violence and injuries on an individual level include chronic pain, gastrointestinal disorders, battering injuries and disability (Jina & Thomas, 2013:17). Blunt-force trauma by a life partner is most frequently inflicted on the head, face and neck, followed by musculoskeletal and genital injuries (WHO, 2014d:14). Psychological disorders include anxiety, mood disorders, post-traumatic stress disorder and depression that may result in suicidal thoughts (Flury *et al.*, 2010:4; Roush, 2014:1; WHO, 2014d:16). Substance abuse, dangerous and unwanted sexual practices and uncontrolled chronic diseases may not only cause psychological disorders, but aggravate it dramatically (Flury *et al.*, 2010:4; WHO, 2014d:16).

#### 2.6.1.3 Management and prevention on individual level

Individual level prevention of violence and injuries focuses primarily on two objectives. First, it aims to encourage healthy attitudes and behaviour in children and young people in order to protect them as they grow up. Second, it aims to change attitudes and behaviour in individuals who have already become violent or are at risk of harming themselves. In particular, it aims to ensure that people can resolve differences and conflicts without resorting to violence and injuries (WHO, 2002:25). Seeing that this study focuses on older people the types of approaches that will be discussed will only include the second objective.

In SA examples of these programmes are the Trauma Centre for Survivors of Violence and Torture. The centre presents management and prevention programmes on all four levels of the social-ecological model of violence and injuries. The main reasons for clients accessing the counselling service at the centre are criminal violence, domestic abuse and assault. The percentage of men and women receiving counselling in 2010 are 53% of men and 47% of women seeking mental health assistance. Most men seek counselling to deal with armed assault and vicarious trauma stemming from exposure to traumatic incidents such as fires, floods and train or motor vehicle fatalities. An emerging trend is the increase in men seeking support for domestic violence and interpersonal conflict at home. Men who are victims of physical abuse at the hands of their partners raise issues about their masculinity. These clients display feelings of shame and anger towards women empowerment stemming from a sense of

disempowerment (Taylor, 2010:12). According to the South Africa violence prevention model 2014 there are no case studies about violence and injury prevention programmes in the North West province (United Nations Children's Fund works UNICEF, 2014:8).

### **2.6.2 Violence and injuries in rural areas on a relationship level**

Personal relationships such as family, friends, intimate partners and peers may expose the chances of being a victim of violence for example having a violent partner. However it can also influence the risks of becoming a perpetrator of violence. For example, having violent friends may influence whether a young person engages in or becomes a victim of violence (Shihadi, 2015:115).

#### **2.6.2.1 Relationship risk factors for being a victim of violence and injuries**

In rural areas the perpetrator of the crime is more likely to be a family member or friend leading to not reporting the violence and injuries (DeKeseredy, 2014:2). Relationships in which violence occurs are typically more distressed, more conflictual and characterized by more negative interactions than nonviolent relationships (Riggs *et al.*, 2000:1292).

##### *Partners*

When focusing on violent partners research has shown that women are much more likely to be harmed inside an intimate partner relationship than by a stranger (Lanier & Maume, 2009:2). In 2013 the WHO estimated that 38% of female homicides globally were committed by male partners while the corresponding figure for men was 6% (WHO, 2014d). Studies have shown the risk of both lethal and nonlethal violence increases significantly when women want to leave, are trying to leave, are in the process of leaving, or have left a relationship (Rennison *et al.*, 2013:2). Several characteristics of the couple relationship influence the likelihood of being abused, cohabiters' are more likely to experience violence than married women, relationship stressors, including large family size and low socioeconomic status contributes to the risk of being abused (Flake, 2005:357; Sabri *et al.*, 2014:293).

##### *Family members*

Violent partners in a marriage is not the only risk factor for intermit violence in a marriage or co habiting. Two studies (Kaur & Garg, 2010; Raj *et al.*, 2011) have reported that extended family perpetrators of violence most often cited were mother's in-law. The study from India also reported that the mother-in-law influenced the husband to inflict violence and injuries on their wives (Raj *et al.*, 2011:250).

### 2.6.2.2 Relationship risk factors for being a perpetrator of violence and injuries

Persons with certain risk factors are more likely to become perpetrators of violence and injuries. However the risk factors contribute to violence and injuries but might not be direct causes. Not everyone who is identified as "at risk" becomes involved in violence and injuries. Some relationship risk factors for victimization and perpetration are the same, while others are associated with one another (CDC, 2016).

#### *Family members*

Relationship risk factors for being a perpetrator of violence start as early as childhood. Children who suffer rejection, neglect, harsh physical punishment and sexual abuse or the witnessing of violence at home or in the community are at greater risk of engaging in aggressive and antisocial behaviour at later stages in their development, including violent behaviour as adults (Widom *et al.*, 2014:651). Studies also show that children who witness violence between their parents are more likely to commit violent offences (Welsh & Farrington, 2012:55).

#### *Peers*

Having delinquent friends is an important predictor of offending later on in life (Welsh & Farrington, 2012:58). Research shows that youths are much more likely to engage in deviant behaviour for example violence when the behaviour is encouraged and approved by their friends (WHO, 2002:13).

### 2.6.2.3 Management and prevention on relationship level

Prevention and management programmes on relationship level focus mainly on influencing the types of relationships that victims and perpetrators have with the people with whom they most regularly interact (WHO, 2002:26). Examples of these programmes would be marriage or family therapy and counselling, training in parenting programmes or mentoring programmes.

## **2.6.3 Violence and injuries on a rural community level**

Opportunities for violence and injuries are greater in certain community contexts than others for instance; areas with a high poverty rate are more likely to have a higher violence rate (Matzopoulos *et al.*, 2010a:4; Winnersjo *et al.*, 2012:88). According to the World Bank 36% of South African citizens classify their lifestyle as rural, implying that they feel free to practice their customs and culture in an environment conducive to an agrarian rural economy (Department of Rural Development & Land Reform, 2013:4; World Bank, 2015). Nonetheless South African rural societies remain some of the most disadvantaged societies in the world, most rural communities live in severe poverty and there is very little development activities taking place in these areas (Gopaul, 2009:1; Gwanya, 2010:4). Access to employment, education, land,

housing, health services and other essential resources still divide them from their urban neighbours (Gopaul, 2009:1). These factors all contribute to the community risk factors for violence and injuries (Crais, 2011:2; Doolan *et al.*, 2007:5; Matzopoulos *et al.*, 2010c:4)

### 2.6.3.1 Risk factors

#### 2.6.3.1.1 Community risk factors for being a victim of violence and injuries

##### *Poverty*

Rural communities in particular are characterised by low socio-economic status hence violence and injuries (Doolan *et al.*, 2007). Extreme poverty is often associated with violence whether in the form of large-scale war or in the petty oppressions exercised by the powerful over the weak (Crais, 2011:2).

##### *Inadequate victim services*

If a rural victim tries to report or take a stand against the perpetrator they are nearly twice as likely to be turned away from services because of the insufficient number of community-based health programmes plus they also face barriers to accessing services because of geographic distance and isolation (Peek-Asa *et al.*, 2011:1743). In rural areas violence is often not reported to the police for various reasons. These reasons include social isolation of the community and the victim of violence because a rural community is an isolated area and there are few protection services. Victims might also be uneducated and uninformed about violence due to insufficient awareness campaigns and isolation (DeKeseredy, 2014:2). Members of the community often have no transport to the services there are, for example the police station (Peek-Asa *et al.*, 2011:1743).

##### *Isolation*

A victim of violence and injuries in a rural area suffers a double isolation factor. Not only do the victims isolate themselves from everyone because of the violence and injuries, but a rural community also has a smaller population than urban communities and the victim feels isolated in the community itself because of a lack of social support (DeKeseredy, 2014:2; Lee & Ousey, 2010:900).

#### 2.6.3.1.2 Management and prevention on community level

Community-based violence and injury prevention focus on the activities to raise public awareness of violence and injuries, address the social and material causes and make provision for the care and support of victims (WHO, 2002:27). Examples of raising awareness in the community are 16 Days of Activism for No Violence Against Women and Children, The Red

Flag Campaign and A Safer South Africa for Women and Children. All these programmes use different forms of awareness techniques for example Facebook, websites and community marches for raising awareness of violence and injuries.

#### **2.6.4 Violence and injuries on a rural society level**

##### 2.6.4.1 Risk factors

###### *Socio-cultural factors of violence*

Socio-cultural factors such as traditional gender and social norms supportive of violence are associated with a man's risk of abusing his partner. Cross-cultural studies indicated that intimate-partner violence is more likely in societies where violence has become an everyday occurrence, such as may be found in conflict areas. Socio-cultural inequality has also been implicated in risks of violence (Matzopoulos *et al.*, 2010c:2).

###### *Weak policy safety nets*

In SA a number of legislative reforms and prevention programmes for violence and injuries have been instituted for including in the Domestic Violence Act No.116 of 1998 (South African Law Commission, 1999), Commission on Gender Equality Act No. 39 of 1996 and Criminal Law Forensic Procedures Amendment Act No. 6 of 2010. Prevention programmes for violence and injuries are often linked to HIV prevention efforts, and have used many approaches. These include large-scale campaigns, sophisticated education-entertainment or so-called edutainment programmes, skills building and economic empowerment programming, community mobilisation, and participatory group education efforts, aiming to change attitudes and norms that support violence in young adults and children but less programmes for adults (Catalano *et al.*, 2012:1659; Ellsberg *et al.*, 2015:4-5).

The effectiveness of political structures in applying social protection and violence prevention strategies is also an important factor in determining rates of violence (Matzopoulos *et al.*, 2010c:3). Despite the policies and programmes of government efforts and non-governmental organisations collaborations are not effective. This is evidenced by the fact that violence and injuries are the second leading cause of mortality and DALY in SA (Norman *et al.*, 2007:696; Seedat *et al.*, 2009:1011; WHO, 2013b:12). For every violence-related death there are many more South Africans seeking emergency treatment for violence-sustained injuries.

In Cape Town, Western Cape Province, 9 236 trauma admissions occurred from October 2010 to September 2011. From these admissions 21% were caused by assault with a sharp instrument (WHO, 2014d:12). SA's rates of fatal violence are five to eight times higher than the global average for females and males respectively (Matzopoulos *et al.*, 2010c:1). In 2014 it is

reported that 33% of the crimes in SA were acts of violence (Institute of race relations, 2015:704). In 2013 the Northern Cape experienced the highest number of deaths due to assault with 23.1% and the Western-Cape was not far behind with 18.7% (Statistics South Africa, 2013). A greater focus must be placed on more effective multispectral policies. Actions should also be implemented to target alcohol control, sexual violence and inequality, and sustainable development.

#### 2.6.4.2 Consequences and outcomes

When focusing on the societal level, violence and injuries also has significant economic costs in terms of expenditures on service provision, lost income, decreased productivity, and negative impacts on future human capital formation (Fleming *et al.*2013:1). This starts the cycle of the social-ecological model all over again because financial stress and a country's low economic development form the risk factors for violence and injuries once again.

### **2.7 Conclusion**

Violence and injuries are globally a reality and in SA. Although violence and injuries vary in definitions and typologies, literature suggests that both concepts have similar risk factors and consequences. These consequences not only affect the individual as a victim but also the family members of the victim, the community and greater society, as presented by the social-ecological model. In first world countries violence and injuries in rural areas have been well documented and numerous research has been done in the past few years. However, there is a large literature gap on statistics for rural areas in SA, which would provide a picture of violence and injuries in a specific community. Knowledge about the true extent of the problem in South African rural areas is hindered by a lack of data. Without such data it is difficult to develop effective national plans of action and policies, prevention programmes and services for victims.

## 2.8 References

- Abramsky, T., Watts, C.H., Garcia-Moreno, C., Devries, K., Kiss, L., Ellsberg, M. & Heise, L. 2011. What factors are associated with recent intimate partner violence? Findings from the WHO multi-country study on women's health and domestic violence. *BMC public health*, 11(1):109-125.
- Atwoli, L., Stein, D.J., Williams, D.R., McLaughlin, K.A., Petukhova, M., Kessler, R.C. & Koenen, K.C. 2013. Trauma and posttraumatic stress disorder in South Africa: analysis from the South African stress and health study. *BMC psychiatry*, 13(1):182-193.
- Ayuurebobi, K., Masanja, H., Kellerman, R. & Owusu-Agyei, S. 2012. Risk factors for injury mortality in rural Tanzania: a secondary data analysis. *BMJ open*, 2(6):e001721.
- Banerjee, S., Chowdhury, A.N., Schelling, E. & Weiss, M.G. 2013. Household survey of pesticide practice, deliberate self-harm, and suicide in the Sundarban region of West Bengal, India. *BioMed research international*, 13(1):182-193.
- Banyard, V.L. 2011. Who will help prevent sexual violence: creating an ecological model of bystander intervention. *Psychology of violence*, 1(3):216-229.
- Bellis, A.B., Hughes, K., Perkins, C. & Bennett, A. 2012. Protecting people promoting health. Liverpool: Centre for Public Health.
- Boles, S.M. & Miotto, K. 2003. Substance abuse and violence: a review of the literature. *Aggression and violent behavior*, 8(2):155-174.
- Bowman, B., Stevens, G., Eagle, G. & Matzopoulos, R. 2014. Bridging risk and enactment: the role of psychology in leading psychosocial research to augment the public health approach to violence in South Africa. *South African journal of psychology*, 45(3):279-293.
- Boxer, P., Rowell Huesmann, L., Dubow, E.F., Landau, S.F., Gvirsman, S.D., Shikaki, K. & Ginges, J. 2013. Exposure to violence across the social ecosystem and the development of aggression: a test of ecological theory in the Israeli-Palestinian conflict. *Child development*, 84(1):163-177.
- Breiding, M., Basile, K., Smith, S., Black, M. & Mahendra, R. 2015. Intimate partner violence surveillance: uniform definitions and recommended data elements, version 2.0. Atlanta, Ga.: National Centre for Injury Prevention and Control, Centres for Disease Control and Prevention.
- Bronfenbrenner, U. 1994. Ecological models of human development. *Readings on the development of children*, 2:37-43.

- Butchart, A. 2006. Violence and public health: an integrated, evidence based approach to preventing domestic violence and child abuse. (*In UNAFEI annual report and resource material series No, 69. Tokyo: UNAFEI. p. 64-78.*)
- Catalano, R.F., Fagan, A.A., Gavin, L.E., Greenberg, M.T., Irwin, C.E., Ross, D.A. & Shek, D.T. 2012. Worldwide application of prevention science in adolescent health. *The Lancet*, 379(9826):1653-1664.
- CDC (Centers for Disease Control and Prevention). 2015. Intimate partner violence: definitions. Atlanta, Ga.: CDC. <http://www.cdc.gov/violenceprevention/intimatepartnerviolence/definitions.html> Date of access: 22 Sep. 2015.
- CDC (Centers for Disease Control and Prevention). 2016. Self-directed violence and other forms of self-injury. <http://www.cdc.gov/ncbddd/disabilityandsafety/self-injury.html> Date of access: 24 Jul. 2016.
- Choo, E.K., Benz, M., Rybarczyk, M., Broderick, K., Linden, J., Boudreaux, E.D. & Ranney, M.L. 2014. The intersecting roles of violence, gender, and substance use in the emergency department: a research agenda. *Academic emergency medicine*, 21(12):1447-1452.
- Cicchetti, D. & Lynch, M. 1993. Toward an ecological/transactional model of community violence and child maltreatment: consequences for children's development. *Psychiatry*, 56(1):96-118.
- Collier, P. & Vicente, P.C. 2014. Votes and violence: evidence from a field experiment in Nigeria. *Economic journal*, 124(574):F327-F355.
- Crais, C. 2011. Poverty, war and violence in South Africa. New York: Cambridge University Press.
- Dahlberg, L.L. & Krug, E.G. 2002. Violence: a global public health problem. *Ciência & saúde coletiva*, 11:1163-1178.
- Dahlberg, L.L. & Marcy, J.A. 2009. The history of violence. *American Medical Association journal of ethics*, 11(2):167-172.
- Dandona, R., Kumar, G.A., Ivers, R., Joshi, R., Neal, B. & Dandona, L. 2010. Characteristics of non-fatal fall injuries in rural India. *Injury prevention*, 16(3):166-171.
- De Haan, W. 2008. Violence as an essentially contested concept. New York. NY: Springer.
- DeKeseredy, W.S. 2014. New directions in feminist understandings of rural crime. *Journal of rural studies*, 39:180-187.

- Doolan, K., Ehrlich, R. & Myer, L. 2007. Experience of violence and socioeconomic position in South Africa: a national study. *Plos one*, 2(12):e1290.
- Durrant, R. 2011. Collective violence: an evolutionary perspective. *Aggression and violent behavior*, 16(5):428-436.
- Eager, P.W. 2016. From freedom fighters to terrorists: women and political violence. London: Routledge.
- Eastman, M. 2013. Old age abuse: a new perspective. New York. NY: Routledge.
- Edmondson, A.J., Brennan, C.A. & House, A.O. 2016. Non-suicidal reasons for self-harm: a systematic review of self-reported accounts. *Journal of affective disorders*, 191:109-117.
- Ellsberg, M., Arango, D.J., Morton, M., Gennari, F., Kiplesund, S., Contreras, M. & Watts, C. 2015. Prevention of violence against women and girls: what does the evidence say? *The Lancet*, 385(9977):1555-1566.
- Elrod, P. & Ryder, R.S. 2013. Juvenile justice: a social, historical, and legal perspective. Sudbury, Mass.: Jones & Bartlett Publishers
- Flake, D.F. 2005. Individual, family, and community risk markers for domestic violence in Peru. *Violence against women*, 11(3):353-373.
- Fleming, P.J., Barker, G., McCleary-Sills, J. & Morton, M. 2013. Gender quality & development. Women's voice, agency, & participation research series, 2013 No. 1. (This paper was commissioned by the World Bank Group to help inform a forthcoming report on women's voice, agency, and participation. It does not necessarily reflect the views and research of the World Bank Group.)
- Flury, M., Nyberg, E. & Riecher-Rössler, A. 2010. Domestic violence against women: definitions, epidemiology, risk factors and consequences. *Swiss medical weekly*, 140(w13099):6.
- anon. 2016. Perpetrator risk factors for violence against women. <https://www.futureswithoutviolence.org/perpretrator-risk-factors/> Date of access: 22 Aug. 2016.
- Gallaher, J.R., Wildfire, B., Mabedi, C., Cairns, B.A. & Charles, A.G. 2016. Intentional injury against children in Sub-Saharan Africa: a tertiary trauma centre experience. *Injury*, 47(4):837-841.
- García-Moreno, C. 2013. Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence. Genève: World Health Organization.

- Garrib, A., Herbst, A.J., Hosegood, V. & Newell, M. L. 2011. Injury mortality in rural South Africa 2000–2007: rates and associated factors. *Tropical medicine & international health*, 16(4):439-446.
- Goodwin, J. 2012. Introduction to a special issue on political violence and terrorism: political violence as contentious politics. *Mobilization: an international quarterly*, 17(1):1-5.
- Gopaul, M. 2009. The significance of rural areas in South Africa for tourism development through community participation with special reference to Umgababa, a rural area located in the province of KwaZulu-Natal. Pretoria: University of South Africa. (Dissertation - MA.)
- Gosavi, S.V. & Deshmukh, P.R. 2014. Epidemiology of injuries in rural Wardha, central India. *Medical journal armed forces India*, 70(4):380-382.
- Government of Canada. 2016. About family violence. <http://www.justice.gc.ca/eng/cj-jp/fv-vf/about-apropos.html> Date of access: 08 Mar. 2016.
- Gradín, C. 2013. Race, poverty and deprivation in South Africa. *Journal of African economies*, 22(2):187-238.
- Gwanya, T. 2010. South Africa position paper on rural development: a model for the Comprehensive Rural Development Programme. Pretoria: Department of Rural Development and Land Reform.
- Gyedu, A., Nakua, E., Otupiri, E., Mock, C., Donkor, P. & Ebel, B. 2014. Incidence, characteristics and risk factors for household and neighborhood injury among young children in semiurban Ghana: a population-based household survey. *Injury prevention*, 21:e71-e79.
- Haegerich, T.M. & Dahlberg, L.L. 2011. Violence as a public health risk. *American journal of lifestyle medicine*, 5:392-406.
- Hammer, R.M., Moynihan, B. & Pagliaro, E.M. 2013. Forensic nursing: a handbook for practice. 2<sup>nd</sup> ed. Burlington, Mass.: Jones & Bartlett Learning.
- Herrenkohl, T.I., Maguin, E., Hill, K.G., Hawkins, J.D., Abbott, R.D. & Catalano, R.F. 2000. Developmental risk factors for youth violence. *Journal of adolescent health*, 26(3):176-186.
- Higginson, A., Mazerolle, L., Davis, J., Bedford, L. & Mengersen, K. 2013. The impact of policing interventions on interpersonal violent crime in developing countries (Protocol). Washington, D.C.: International Initiative for impact evaluation.
- Hindin, M.J. & Adair, L.S. 2002. Who's at risk? Factors associated with intimate partner violence in the Philippines. *Social science & medicine*, 55(8):1385-1399.

- Hofman, K., Primack, A., Keusch, G. & Hrynkow, S. 2005. Addressing the growing burden of trauma and injury in low-and middle-income countries. *American journal of public health*, 95(1):13-17.
- Holder, Y., Peden, M., Krug, E., Lund, J., Gururaj, G. & Kobusingye, O. 2002. Injury surveillance guidelines. Genève: World Health Organization.
- Huband, N. & Tantam, D. 2009. Understanding repeated self-injury: a multidisciplinary approach. New York: Palgrave Macmillan.
- Hughes, K., Bellis, M.A., Hardcastle, K.A., Butchart, A., Dahlberg, L.L., Mercy, J.A. & Mikton, C. 2014. Global development and diffusion of outcome evaluation research for interpersonal and self-directed violence prevention from 2007 to 2013: a systematic review. *Aggression and violent behavior*, 19(6):655-662.
- Institute for Health Metrics and Evaluation (IHME). 2016. Country profile: South Africa. Seattle, Wash.: IHME. <http://www.healthdata.org/print/4329> Date of access: 03 Jan. 2016.
- Institute of Race Relations. 2015. South Africa survey 2014/2015. Pretoria: Institute of Race Relations.
- Jamison, D.T. 2006. Disease and mortality in sub-Saharan Africa. New York. NY.: World Bank Publications.
- Javdani, S., Abdul-Adil, J., Suarez, L., Nichols, S.R. & Farmer, A.D. 2014. Gender differences in the effects of community violence on mental health outcomes in a sample of low-income youth receiving psychiatric care. *American journal of community psychology*, 53(3/4):235-248.
- Jewkes, R. 2002. Intimate partner violence: causes and prevention. *The Lancet*, 359(9315):1423-1429.
- Jewkes, R., Sikweyiya, Y., Dunkle, K. & Morrell, R. 2015. Relationship between single and multiple perpetrator rape perpetration in South Africa: a comparison of risk factors in a population-based sample. *BMC public health*, 15(1):1-10.
- Ji, K. & Finkelhor, D. 2015. A meta-analysis of child physical abuse prevalence in China. *Child abuse & neglect*, 43:61-72.
- Jina, R. & Thomas, L.S. 2013. Health consequences of sexual violence against women. *Best practice & research clinical obstetrics & gynaecology*, 27(1):15-26.
- Kaur, R. & Garg, S. 2010. Domestic violence against women: a qualitative study in a rural community. *Asia-Pacific journal of public health*, 22(2):242-251.

- Kilpatrick, D.G., Acierno, R., Resnick, H.S., Saunders, B.E. & Best, C.L. 1997. A 2-year longitudinal analysis of the relationships between violent assault and substance use in women. *Journal of consulting and clinical psychology*, 65(5):834-847.
- Krause, K. 2009. Beyond definition: violence in a global perspective. *Global crime*, 10(4):337-355.
- Krug, E.G., Mercy, J.A., Dahlberg, L.L. & Zwi, A.B. 2002. The world report on violence and health. *The Lancet*, 360(9339):1083-1088.
- Krug, E.G., Sharma, G.K. & Lozano, R. 2000. The global burden of injuries. *American journal of public health*, 90(4):523-526.
- Kumagai, F. & Ishii-Kuntz, M. 2016. Family violence in Japan: a life course perspective. Tokyo: Springer.
- Lanier, C. & Maume, M.O. 2009. Intimate partner violence and social isolation across the rural/urban divide. *Violence against women*, 15(11):1311-1330.
- Lizardo, O. 2015. Defining and theorizing terrorism: a global actor-centered approach. *Journal of world-systems research*, 14(2):91-118.
- Löfving-Gupta, S., Lindblad, F., Stickley, A., Schwab-Stone, M. & Ruchkin, V. 2015. Community violence exposure and severe posttraumatic stress in suburban American youth: risk and protective factors. *Social psychiatry and psychiatric epidemiology*, 50(4):539-547.
- Logie, C., Alaggia, R. & Rwigema, M. 2014. A social ecological approach to understanding correlates of lifetime sexual assault among sexual minority women in Toronto, Canada: results from a cross-sectional internet-based survey. *Health education research*, 29(4):671-682.
- London, L. 2013. Human rights, environmental justice, and the health of farm workers in South Africa. *International journal of occupational and environmental health*, 9(1):59-68.
- Marquez, P.V. & Farrington, J.L. 2013. The challenge of non-communicable diseases and road traffic injuries in sub-Saharan Africa: an overview. Washington, D.C: World Bank,
- Matzopoulos, R., Bowman, B., Mathews, S. & Myers, J. 2010. Applying upstream interventions for interpersonal violence prevention: an uphill struggle in low- to middle-income contexts. *Health policy*, 97(1):62-70.
- Mayosi, B.M., Lawn, J.E., Van Niekerk, A., Bradshaw, D., Karim, S.S.A., Coovadia, H.M. & Team, L.S.A. 2012. Health in South Africa: changes and challenges since 2009. *The Lancet*, 380(9858):2029-2043.

- Merriam Webster's Medical Dictionary. 2015. Definition of violence. <http://www.merriam-webster.com/dictionary/violence> Date of access: 23 Jul. 2016.
- Merson, H.M., Black, R.E. & Mills, A.J. 2012. Global health: diseases, programs, systems and policies. 3<sup>rd</sup>ed. Burlington, Mass.: Jones & Bartlett Publishers.
- Michau, L., Horn, J., Bank, A., Dutt, M. & Zimmerman, C. 2015. Prevention of violence against women and girls: lessons from practice. *The Lancet*, 385(9978):1672-1684.
- Midei, A. & Matthews, K. 2011. Interpersonal violence in childhood as a risk factor for obesity: a systematic review of the literature and proposed pathways. *Obesity reviews*, 12(5):e159-e172.
- Mkhize, S., Gopal, N., &Collings, S.J. 2012. The impact of community violence on learners: a study of a school in the Swayimana rural area. (*InActa Criminologica.CRIMSA Conference: special edition* 1:38-45.)
- Morgan, A. & Chadwick, H. 2009. Key issues in domestic violence. Canberra: Australian Institute of Criminology.
- Murray, C.J., Vos, T., Lozano, R., Naghavi, M., Flaxman, A.D., Michaud, C. & Abdalla, S. 2013. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, 380(9859):2197-2223.
- Murray, J., De Castro Cerqueira, D.R. & Kahn, T. 2013. Crime and violence in Brazil: systematic review of time trends, prevalence rates and risk factors. *Aggression and violent behavior*, 18(5):471-483.
- Naved, R.T. & Persson, L.Å. 2005. Factors associated with spousal physical violence against women in Bangladesh. *Studies in family planning*, 36(4):289-300.
- Nel, H. 2006. Violence - a universal challenge - and how to prevent it. *Discourse*, 34(1):17-25.
- NIMSS (National Injury Mortality Surveillance System). 2008. A profile of fatal injuries in South Africa. Cape Town: MIMSS.
- Norman, R., Matzopoulos, R., Groenewald, P. & Bradshaw, D. 2007. The high burden of injuries in South Africa. *Bulletin of the World Health Organization*, 85(9):695-702.
- Norman, R., Schneider, M., Bradshaw, D., Jewkes, R., Abrahams, N., Matzopoulos, R. & Vos, T. 2010. Interpersonal violence: an important risk factor for disease and injury in South Africa. *Population health metrics*, 8(1):32-43.

- Norton, R. & Kobusingye, O. 2013. Injuries. *New England journal of medicine*, 368(18):1723-1730.
- Oxford Dictionaries. 2016. Definition of violence in English. Oxford: Oxford University Press.
- Pain, R. 2014. Everyday terrorism connecting domestic violence and global terrorism. *Progress in human geography*, 38(4):531-550.
- Peek-Asa, C., Wallis, A., Harland, K., Beyer, K., Dickey, P. & Saftlas, A. 2011. Rural disparity in domestic violence prevalence and access to resources. *Journal of women's health*, 20(11):1743-1749.
- Polinder, S., Haagsma, J.A., Lyons, R.A., Gabbe, B.J., Ameratunga, S., Cryer, C., Derrett, S., Harrison, J.E., Segui-Gomez, M. & Van Beeck, E.F. 2012. Measuring the population burden of fatal and nonfatal injury. *Epidemiologic reviews*, 34(1):17-31.
- Powell, K.E., Mercy, J.A., Crosby, A.E., Dahlberg, L.L. & Simon, T.R. 2008. Public health models of violence and violence prevention. (In Kurtz, L., ed. *Encyclopedia of violence, peace, and conflict*. Oxford: Elsevier. p. 175-187.)
- Raj, A., Sabarwal, S., Decker, M.R., Nair, S., Jethva, M., Krishnan, S. & Silverman, J.G. 2011. Abuse from in-laws during pregnancy and post-partum: qualitative and quantitative findings from low-income mothers of infants in Mumbai, India. *Maternal and child health journal*, 15(6):700-712.
- Rayner, G. & Warne, T. 2016. Interpersonal processes and self-injury: a qualitative study using Bricolage. *Journal of psychiatric and mental health nursing*, 23(1):54-65.
- Rennison, C.M., DeKeseredy, W.S. & Dragiewicz, M. 2013. Intimate relationship status variations in violence against women urban, suburban, and rural differences. *Violence against women*, 19(11):1312-1330.
- Reza, A., Mercy, J.A. & Krug, E. 2001. Epidemiology of violent deaths in the world. *Injury prevention*, 7(2):104-111.
- Riedel, M. & Welsh, W.N. 2002. *Criminal violence: patterns, causes, and prevention*. Los Angeles, Calif.: Roxbury.
- Riggs, D.S., Caulfield, M.B. & Street, A.E. 2000. Risk for domestic violence: factors associated with perpetration and victimization. *Journal of clinical psychology*, 56(10):1289-1316.
- Rockett, I.R., Regier, M.D., Kapusta, N.D., Coben, J.H., Miller, T.R., Hanzlick, R.L., Todd, K.H., Sattin, R.W., Kennedy, L.W., Kleinig, J. & Smith, G.S. 2012. Leading causes of unintentional

and intentional injury mortality: United States, 2000-2009. *American journal of public health*, 102(11):e84-e92.

Roush, K. 2014. The lived experience of intimate partner violence in the context of the rural setting. New York. NY. : New York University.

Rutherford, A. 2008. Violence/intentional injuries: epidemiology and overview. Randwick, NSW, Australia: Elsevier.

Rutherford, A., Zwi, A.B., Grove, N.J. & Butchart, A. 2007. Violence: a glossary. *Journal of epidemiology and community health*, 61(8):676-680.

Sabri, B., Renner, L.M., Stockman, J.K., Mittal, M. & Decker, M.R. 2014. Risk factors for severe intimate partner violence and violence-related injuries among women in India. *Women & health*, 54(4):281-300.

Sallis, J.F., Owen, N. & Fisher, E.B. 2008. Ecological models of health behavior. *Health behavior and health education. Theory, research, and practice*, 4:465-486.

Sanders, C.K. 2015. Economic abuse in the lives of women abused by an intimate partner a qualitative study. *Violence against women*, 21(1):3-29.

Schrijvers, D.L., Bollen, J. & Sabbe, B.G. 2012. The gender paradox in suicidal behavior and its impact on the suicidal process. *Journal of affective disorders*, 138(1):19-26.

Seedat, M., Van Niekerk, A., Jewkes, R., Suffla, S. & Ratele, K. 2009. Violence and injuries in South Africa: prioritising an agenda for prevention. *The Lancet*, 374(9694):1011-1022.

Sethi, D. 2006. Injuries and violence in Europe: why they matter and what can be done. Copenhagen: WHO Regional Office Europe.

Shaffer, J.N. & Ruback, R.B. 2002. Violent victimization as a risk factor for violent offending among juveniles. Washington, D.C.: U.S. Dept. of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.

Shihadi, N. 2015. Pedagogical and psychological approaches of violence in school. *Studia Universitatis Moldaviae-Științe ale Educației*, 5(85):112-118.

Simister, J.G. 2010. Domestic violence and female genital mutilation in Kenya: effects of ethnicity and education. *Journal of family violence*, 25(3):247-257.

Singh, R. N., Hurley, D. & Singh, D. 2016. Towards identifying and ranking selected types of violence against women in North India. *International journal of comparative and applied criminal justice*, 112(1):11-26.

South Africa. Department of Rural Development & Land Reform. 2013. Department of Rural Development & Land Reform strategic plan 2010 - 2013. Pretoria: Department of Rural Development & Land Reform.

Statistics South Africa. 2013. Mortality and causes of death in South Africa: findings from death notification, 2013. [http://www.statssa.gov.za/publications/P03093/CoD\\_2013\\_presentation.pdf](http://www.statssa.gov.za/publications/P03093/CoD_2013_presentation.pdf) Date of access: 10 Aug. 2015.

Steeves, G.M., Petterini, F.C. & Moura, G.V. 2015. The interiorization of Brazilian violence, policing, and economic growth. *Economia*, 16(3):359-375.

Stephenson, R., Winter, A. & Hindin, M. 2013. Frequency of intimate partner violence and rural women's mental health in four Indian states. *Violence against women*, 19(9):1133-1150.

Stith, S.M., Rosen, K.H., Middleton, K.A., Busch, A.L., Lundeberg, K. & Carlton, R.P. 2000. The intergenerational transmission of spouse abuse: a meta-analysis. *Journal of marriage and family*, 62(3):640-654.

Straus, S. 2012. Wars do end! Changing patterns of political violence in sub-Saharan Africa. *African affairs*, 111:179-201.

Stylianou, A.M., Postmus, J.L. & McMahon, S. 2013. Measuring abusive behaviors is economic abuse a unique form of abuse? *Journal of interpersonal violence*, 28(16):3186-3204.

Swart, L. A., Laher, H., Seedat, M. & Gantchev, G. 2012. Urban and rural differences in child injury deaths in South Africa: a one-year review. *African safety promotion: a journal of injury and violence prevention*, 10(2):28-40.

Taylor, J. 2010. The Trauma Centre for Survivors of Violence and Torture. Annual report, 2010. Pretoria: The Trauma Centre

Tilly, C. 2003. The politics of collective violence. Cambridge: Cambridge University Press.

Tulchinsky, T. & Varavikova, E. 2014. The new public health. 3<sup>rd</sup>ed. London: Elsevier.

UNICEF South Africa. 2014. South Africa violence prevention model and action plan: National Prosecution Authority/UNICEF. [http://www.unicef.org/southafrica/SAF\\_resources\\_violenceprevmodel.pdf](http://www.unicef.org/southafrica/SAF_resources_violenceprevmodel.pdf) Date of access: 10 Mar. 2014.

Van Niekerk, A., Suffla, S. & Seedat, M., eds. 2008. Crime, violence and injury prevention in South Africa: data to action. Pretoria: Medical Research Council, University of South Africa.

Värnik, P. 2012. Suicide in the world. *International journal of environmental research and public health*, 9(3):760-771.

- Vest, J.R., Catlin, T.K., Chen, J.J. & Brownson, R.C. 2002. Multistate analysis of factors associated with intimate partner violence. *American journal of preventive medicine*, 22(3):156-164.
- Wallace, P.H. & Roberson, C. 2015. Family violence: legal, medical, and social perspectives. New York. NY.: Routledge.
- Welsh, B.C. & Farrington, D.P. 2012. The Oxford handbook of crime prevention. Oxford: Oxford University Press.
- World Health Organization. 2002. World report on violence and health. Geneva: World Health Organization.
- World Health Organization. 2013a. Global status report on road safety 2013: supporting a decade of action. Geneva: World Health Organization.
- World Health Organization. 2013b. WHO country cooperation strategy. Geneva: World Health Organization.
- World Health Organization. 2014a. Injuries and violence: the facts 2014 (No. 9241508019). Geneva: World Health Organization.
- World Health Organization. 2014b. Global report on violence and prevention. Geneva: World Health Organization.
- World Health Organization. 2015. Definition and typology of violence. Geneva: World Health Organization. <http://www.who.int/violenceprevention/approach/definition/en/> Date of access: 23 Apr. 2015.
- Widom, C.S., Czaja, S. & Dutton, M.A. 2014. Child abuse and neglect and intimate partner violence victimization and perpetration: a prospective investigation. *Child abuse & neglect*, 38(4):650-663.
- Winnersjo, R., Ponce de Leon, A., Soares, J.F. & Macassa, G. 2012. Violence and self-reported health: does individual socioeconomic position matter? *Journal of injury and violence research*, 4(2):87-95.
- Wolf, A., Gray, R. & Fazel, S. 2014. Violence as a public health problem: an ecological study of 169 countries. *Social science & medicine*, 104:220-227.
- World Bank Group. 2015. Rural population (% of total population). <http://data.worldbank.org/indicator/SP.RUR.TOTL.ZS/countries/1W?display=default> Date of access: 22 Apr. 2015.

Wu, L., Chen, H., Hu, Y., Xiang, H., Yu, X., Zhang, T., Cao, Z. & Wang, Y. 2012. Prevalence and associated factors of elder mistreatment in a rural community in People's Republic of China: a cross-sectional study. *Plos one*, 7(3): e33857.

Zhao, S., & Zhang, J. 2014. Suicide risks among adolescents and young adults in rural China. *International journal of environmental research and public health*, 12(1):131-145.

Zhao, X., Chen, J., Chen, M. C., Lv, X. L., Jiang, Y. H., & Sun, Y. H. (2014). Left-behind children in rural China experience higher levels of anxiety and poorer living conditions. *Acta paediatrica*, 103(6):665-670.

Zhou, C. & Banik, D. 2014. Access to justice and social unrest in China's countryside: disputes on land acquisition and compensation. *Hague journal on the rule of law*, 6(02):254-275.

# CHAPTER 3: A representation of violence and injuries in a South African rural community (Manuscript)

## 3.1 Introduction

The following manuscript titled: A representation of violence and injuries in a South African rural community, is an article written for the *African Safety Promotion Journal*. This chapter will be written according to the style guidelines of the journal. The contribution of each of the researchers involved in this study is given in the following

Name	Contributorship
Jurita van Deventer	<ul style="list-style-type: none"> <li>• Drafting the work as well as acquisition, analysis, and interpretation of data for the work</li> </ul>
Iolanthé M Kruger	<ul style="list-style-type: none"> <li>• Substantial contributions to the conception and design of the work; as well as the acquisition, analysis, and interpretation of data for the work, revising it critically for important intellectual content</li> <li>• Final approval of the version to be published</li> <li>• Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</li> </ul>
Petra Bester	<ul style="list-style-type: none"> <li>• Substantial contributions to the conception and design of the work; as well as the acquisition, analysis, and interpretation of data for the work, revising it critically for important intellectual content</li> <li>• Final approval of the version to be published</li> <li>• Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</li> </ul>
Marike Cockeran	<ul style="list-style-type: none"> <li>• Analysis, and interpretation of data for the work</li> </ul>

\*Contributions according to the ICMJE guidelines.

The following is a statement from the co-authors confirming their individual contributions towards this manuscript and giving their permission that this manuscript may form part of this dissertation

I declare that I have approved the above-mentioned manuscript, that my contributions, as indicated above, is representative of my actual contribution and that I hereby give consent that it may be published as part of the Master of Health Science in Transdisciplinary Health Promotion dissertation of JM van Deventer.

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Dr IM. Kruger

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Prof. P Bester

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Mrs M Cockeran

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Mrs J.M van Deventer

### **3.2 Author guidelines**

#### **African Safety Promotion Journal**

African Safety Promotion: A Journal of Injury and Violence Prevention seeks to foster the exchange of ideas among safety promotion and injury prevention researchers, practitioners and policy makers primarily in Africa, but also in other regions of the world. Since 2002, the Journal has maintained its publication target of two issues per annum, and in 2005, was accredited by the South African National Department of Education.

#### **Original Contributions**

Full scientific manuscripts submitted for this category should not exceed 6 000 words in length excluding the title, abstract, references, figures and tables.

The manuscripts should be in 12 point Times New Roman font, with the main headings in capitals and bold, and subheadings in sentence case.

All manuscripts should be typed in 1.5 spacing.

No enumerations and section numbering should be included, and all graphs and tables should be inserted at the end of the document.

#### **Publication requirements:**

All contributions should follow the sixth edition of the American Psychological Association (APA) style guide for referencing purposes.

The manuscript must be accompanied by a letter indicating that the article has not been published elsewhere. This letter must be signed by all listed authors to indicate their agreement with the submission.

Contributors may submit the names and contact details of two referees competent to review their manuscript.

Manuscript must be submitted to the Editor-in-Chief, Prof. Ashley van Niekerk. Please send manuscripts via email to [nancy.hornsby@mrc.ac.za](mailto:nancy.hornsby@mrc.ac.za)

Original contribution (6000 words)

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## ABSTRACT

Violence and injuries are a global multifaceted health phenomenon (Kiser *et al.*, 2013:2973) with biological, psychological, social and environmental roots combining individual, relationship, social, cultural and environmental factors (Haegerich & Dahlberg, 2011:392; WHO, 2002:12). Although violence and injuries are two different concepts, the care of the victims requires similar health services and leads to similar consequences which might include disability, psychological trauma and death (Sethi, 2006:ix). Violence and injuries are among the top twenty causes of loss of disability adjusted living years (DALY's), globally. According to the World Health Organization (WHO) it is projected to increase in importance by 2030 (Wolf *et al.*, 2014:220). Currently there are very few population-based studies with information on rural violence and injury rates in South Africa (Sherriff *et al.*, 2015:76). The following paper presents a rural community-based study to determine the types and frequencies of violence and injuries at baseline and five-year follow-ups (2005, 2010 and 2015) and investigates the possible changes in the type and frequencies in violence and injuries over ten years. This study will contribute to filling the gap in literature about rural data and possible recommendations for violence and injuries prevention.

Word count 194

**Key words:** violence, injuries, adults, South Africa, rural community, longitudinal study.

## INTRODUCTION

Violence and injuries are a global multifaceted health phenomenon (Kiser *et al.*, 2013:2973) with biological, psychological, social and environmental roots combining individual, relationship, social, cultural and environmental factors (Haegerich & Dahlberg, 2011:392; WHO, 2002:12). Violence is defined by the World Health Organization (WHO) as "*the intentional use of physical force or power threatened or actual, against oneself, another person or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development or deprivation*" (WHO, 2015). Traditionally injuries are defined as the physical damage to a person caused by an acute transfer of energy (mechanical, thermal, electrical, chemical, or radiation energy) or by the sudden absence of heat or oxygen (Krug *et al.*, 2000:523). Both these definitions have been broadened to include emotional injuries for example psychological harm, maldevelopment, or deprivation (Norton & Kobusingye, 2013:1723).

Although violence and injuries are two different concepts, the care of victims requires similar health services and it also leads to similar consequences, *viz.* disability, psychological trauma, and death (Sethi, 2006:ix). Some of the direct consequences of violence and injuries include chronic pain, gastrointestinal disorders, physical injuries and disability (Jina & Thomas, 2013:17). Psychological disorders that can occur include anxiety, mood disorders, post-traumatic stress disorder and depression that may result in suicidal thoughts (Flury *et al.*, 2010:4; Roush, 2014:1; WHO, 2014b:16). Violence and injuries do not only include direct consequences but also indirect consequences. These might become visible at relationship, community and societal level. The indirect consequences of violence and injuries presented in the social sphere refer to social isolation and broken relationships (Lanier & Maume, 2009:2; Wallace & Roberson, 2016:16), inequality and economic costs (Crais, 2011a:2), unemployment, absenteeism and decreased job performance (WHO, 2014a:17). Furthermore violence and injuries result in substantial economic costs to individuals, households and the community. The effects of violence and injuries place an enormous financial burden on national economies through increased health-care, legal costs, absenteeism from work and loss of productivity (Brown, 2008:203; Vidyavathi, 2015:74; Wallace & Roberson, 2016:37). Losing a breadwinner to a violence or injuries-related event often plunges families into poverty or pushes poorer families further into poverty. The implications of this sudden shattering change in security of individuals and households are both immediate and obvious (Brown, 2008:203; Wallace & Roberson, 2016:38).

Currently violence and injuries are among the top twenty causes of DALY's, worldwide and according to the WHO projected to increase in importance by 2030 (Wolf *et al.*, 2014:220). Unfortunately in low-middle income countries (LMICs) such as South Africa (SA), a lack of reliable statistics has largely hidden the health and development impacts of violence and injuries (WHO, 2014b:21). In SA, the National Injury Mortality Surveillance System (NIMSS) is currently the most detailed source of information on the "who?, what?, when? and where?" of fatal injuries (South African Medical Research Council (SAMRC), 2016). According to the NIMSS interpersonal violence is the leading cause of injury-related death, followed by road traffic injuries (RTIs) (Donson, 2008:13). However, the NIMSS is primarily an urban-based data system, and information on rural violence and injury mortality is still limited (Sherriff *et al.*, 2015:76).

Most studies on violence and injuries in rural areas have been done in Australia, Canada, and the United States of America, all high-income countries (HICs) (Donnermeyer *et al.*, 2013:69). These studies have shown that risk factors such as unemployment, low levels of education, income inequality, poverty, inadequate health services and other essential resources all contribute to the risk factors of violence and injuries (Crais, 2011b:2; Doolan *et al.*, 2007:5; Matzopoulos *et al.*, 2010:4). SAs rural societies remain some of the most disadvantaged societies in the world (Gopaul, 2009:1). Most rural communities live in severe poverty and there is very little development activities taking place in these areas (Gwanya, 2010:4). There are very few population-based studies with information on rural violence and injury rates in SA (Sherriff *et al.*, 2015:76). Hence the objective of the present rural community-based study was to determine the types and frequencies of violence and injuries at baseline and five-year follow-ups (2005, 2010 and 2015) and to investigate possible changes in the type and frequencies in violence and injuries over a period of ten years.

## **METHODS**

Complete descriptions of study design and sampling were reported elsewhere (Rao, 2012; Teo *et al.*, 2009; Yusuf *et al.*, 2011). Briefly, the Prospective Urban and Rural Epidemiology (PURE) study is designed as a longitudinal study, implying that an observational research method is used for data collection, from the same participants (Aschengrau & Seage, 2014:207). Semi-structured questionnaires were used to measure the participants' exposure to conditions that have been self-selected or have been determined by influences outside the control of the researcher. In this

study descriptive statistical analysis will be performed with the cross-sectional data that were collected at five year intervals (2005, 2010 and 2015).

### *Present study*

The present study forms part of the SA leg of the PURE study. The PURE-SA study recruited rural and urban communities. This study made use of the data gathered in two rural communities (referred to as Communities A and B). The community in the rural area was large enough to allow random selection of participants, and was approximately 80 km from urban areas, with as little urban influence as possible. In order to partake in the study, participants had to comply with the criteria of being between the age of 35 and 70 years and have no known non-communicable diseases (NCD's) at baseline (2005).

At baseline (2005) the PURE-SA study approached 3 000 participants from 833 households. During the participant selection process 1 443 participants met the inclusion criteria and were invited to the study. On the day data capturing started (2005) a total of 1 006 participants signed informed consent and participated in the study. Some participants were not retained due to mortality, frailty, discontinued participation and failure in re-contacting the participant for a follow-up survey. In 2010 and 2015 the number of participants was 697 and 539, respectively. During data collection not all participants managed to complete the adult questionnaires used for the present study, therefore the participant numbers of the study varied.

### *[Preferred position for PURE-SA attrition Fig 1]*

During data capturing, participants provided demographic data that included age, gender, marital status, level of education and alcohol use. Individual injury data were collected by means of self-reporting. Participants were asked whether they sustained any injuries during the previous 12 months that were serious enough to limit normal activities. Participants who reported such injuries were asked to select the causes of the injuries from a list of 18 different options. Furthermore participants were asked if they thought violent acts had increased in the community. Whenever they responded with a yes they were asked to choose from different types of violent acts that they believed has increased, as well as whether their households fell victim to certain violent acts and crimes.

### *Statistical analysis*

Completed questionnaires were captured into SPSS (Statistical Package for Social Scientists) ([International Business Machines] IBM, 2012). Descriptive statistical analysis was done of the

2005, 2010 and 2015 data. SPSS were used to generate descriptive data (frequencies, means and standard deviations). Continuous data are presented as mean  $\pm$  SD and categorical data are presented as percentages (%). A two-sample Z-score test was used to compare the proportions for the three cross-sectional periods. A p-value of  $< 0.05$  was regarded as significant.

## **RESULTS**

### *Demographic data*

Demographic characteristics of participants are presented in Table 1. The initial number of participants at baseline (2005) was N=1 006. This number comprised mostly of female participants, n=658 (65.4%). The mean age at baseline was 49.01 $\pm$ 9.97 years. In 2005 more than one third of participants (34.5%) were married, while in 2015 40% reported to be living with a partner. At baseline, most (78%) of the participants reported to have no education or only primary school education. Unemployment remained high throughout the entire study. In addition to the undesirable socioeconomic status (high unemployment rates and the low educational levels), the majority of participants also reported to be current alcohol users. This was especially true for 2010, with approximately 70% of participants reporting to have been using alcohol at the time. This number however, decreased significantly ( $p<0.05$ ) from 2010 to 2015 to only a quarter of the participants reporting current alcohol use. During 2005 significantly ( $p<0.05$ ) more men (51.3%) reported to be current alcohol users whereas in 2010 the opposite was true, with more than three quarters of women reporting current alcohol use compared to only 1 out of every two men ( $p<0.05$ ).

*[Preferred position for table 1]*

### *Violence and injuries on an individual level*

The most frequent violence and injury event reported on individual level was falls. This was observed throughout the 10-year period (Table 2). There was an increase of 290% in the number of participants who sustained fall-related injuries between the year 2005 (n=11) and 2010 (n=43) ( $Z= -6.034$ ;  $p<0.05$ ). However a significant decrease was observed in fall related injuries from 2010 (n=43) to 2015 (n=11) ( $Z\text{-score} = 3.5796$ ;  $p<0.001$ ). Motor vehicle accidents (MVAs) were subdivided into MVAs as passenger or MVAs as pedestrian. The combined reporting of MVAs was the second leading cause of serious injuries reported by the respondents for the 2005 period. However, these injuries accounted for less than 1% of all reported serious injuries. This number further decreased over the period of 10 years.

Even though the combined reporting of violent events (physical assault, domestic violence and armed conflict) was low (<1%) for all three data collection periods (2005, 2010 and 2015), 2010 was marked by higher reporting compared to 2005 and 2015 ( $p < 0.001$ ). In addition 2010 was also the only year that some participants reported suicide attempts ( $n=6$ ). Overall, the number of participants that reported any serious injury or violent events was the highest in 2010 (14.1%) compared to 2005 (3.1%) and 2015 (2.7%).

*[Preferred position for table 2]*

#### *Violence and injuries on a household level*

One representative from each household was asked whether the respective household had been a part of one or more violent act(s) during the previous 12 months (listing in Table 3). No significant differences were observed for any of the violent acts between 2005 and 2015. The leading violent acts reported for 2005 and 2015 were similar, with violent attacks followed by house break-ins, rape and then theft. However, significantly more violent acts were reported in 2010 compared to both 2005 and 2015 ( $p < 0.05$ ), with theft as the most frequent violent act experienced by a household (11.2%), followed by house break-ins (8.1%), violent attacks (7.8%) and women abuse (4.3%).

*[Preferred position for table 3]*

#### *Participants view of violence and injuries in the community*

Figure 3-2 represents 2005, 2010 and 2015 data on participants' views of whether violence and injuries within their community had increased. The overall observation indicated that participants perceived crime to have increased. In 2005 84% of participants indicated that they thought crime had increased in the community. Data from 2010 compared to 2015 showed that participants indicated that according to them crime had significantly increased over the previous 5 years ( $Z = -10.9755$ ;  $p < 0.000$ ) with an indication of 70% of participants in 2010 and 95% of participants in 2015. The majority of the participants perceived that house break-ins, theft, rape and violent attacks had increased. Although the ranked order differed each year, these crimes were the most reported in participants' views. In 2005, 23% of participants felt that break-ins had increased. This number decreased with 1% in 2010 (22%) but still remained as one of the 5 leading perceived crimes over the past 5 years. Views on rape acts increased with 9% from 21% in 2005 to 20% in 2015. Another concern in the community was the view of violent attacks increasing with 13% from 2005 (4%) to 2010 (17%).

[Preferred position for figure 3-2 ]

## DISCUSSION

During the 10 year period, injuries related to falls were the most reported. According to Williams *et al.* (2015:9) the built environment that includes unavailability of paved walking / cycling infrastructure, poor health infrastructure, precarious home and working environments in LMIC, place people living in rural communities at heightened risk of sustaining fall-related injuries. In 2010 of the present study, falls increased with 290% with 70% of participants reporting to have been using alcohol at the time. This might indicate that behavioural risk factors could have contributed to participants falling in this year. High alcohol use is associated with sport events for example soccer. In 2010, SA hosted the Federation International de Football Association (FIFA) world cup.

Biological risk factors for falls include sex, race and age-related decline in strength, balance, vision, cognition, and chronic diseases (Dsouza *et al.*, 2014:36). In the present study the number of reported falls did not significantly increase with age. Furthermore, results from this study correlate with previous findings that women are more likely to fall or suffer from fall-related injuries than men (Chang & Do, 2015:524). Berry and Miller (2008:149) ascribe the risk of injury from falling to poorer lower extremity strength, more difficulties with activities of daily living and higher prevalence of osteoporosis, making them more vulnerable to falls compared to men.

In 2005 and 2015 the second leading cause of violence and injury event was MVAs. However, MVAs have declined over the 10 year period. In Sub-Saharan Africa, environmental factors *viz.* poor law enforcement combined with poor road infrastructure, high traffic mix and little separation of vulnerable road users from high speed motorised traffic, contribute to the high rate of MVAs (Marquez & Farrington, 2013:25). The Dr Kenneth Kaunda District Municipality's Integrated Development Plan Review 2015/16 identified poor maintenance of road infrastructure, potholes and no visible road signs as the main reasons for the problems on and off the road, thereby increasing accidents (Dr Kenneth Kaunda District Municipality, 2016:74).

Violent events like physical assault, domestic violence and armed conflict were reported less than expected for all three data collection periods (2005, 2010 and 2015). This might be explained by a study done by Baier and Prätör (2016:87) who have shown that rural areas are specifically prone to under-reporting of violent acts. In rural areas victims may refrain from

reporting acts of violence possibly due to the perpetrator being more likely a family member or friend (DeKeseredy, 2014:2). Rural communities also tend to have an insufficient number of community-based health programmes as well as geographical and physical isolation (Peek-Asa *et al.*, 2011:1743). The victim of crime survey 2015/16 indicated that the most cited reason for not reporting individual crime to the police were that either the police *could* not do anything or *would* not do anything about it (Stats SA, 2017:71).

Household statistics for violent acts increased significantly in 2010. The Federation International de Football Association (FIFA) world cup hosted in SA in 2010 could have contributed to the increased violent acts. Heightened emotions because of the soccer world cup along with alcohol consumption could have contributed to increased violence (Kirby *et al.*, 2014:271). The participants' view of violent acts in the community correlated with the household statistics that indicated violent attacks, house break-ins, rape and theft were the leading reported violent acts and the leading reported increase according to participants. These statistics also correlate with the larger South African statistics, the victim of crime survey, which reported that “ *South Africans feel violent and property crime is increasing to the extent that the majority of households don't feel safe to walk alone in parks or allow their children to play freely in their neighbourhoods*” (Stats SA, 2017:2). People who reside in rural areas mostly have a low income and cannot afford private vehicles for daily commuting (Joubert *et al.*, 2015:2). Hence people tend to walk more and walking to the nearest shop or church is still a far way to walk. Therefore poor street lights and isolation also contribute to risk factors of violent acts.

## **IMPLICATIONS**

SA is referred to as one of the most violent countries not at war. However 19,278,000 people, 36% of the SA population, live in rural areas with little data regarding violence and injuries. With little data available on SA's violence and injuries there are still 36% of the South African population that are almost not accounted for regarding violence and injuries.

The victim of crime survey 2015/16 reported that communities are being desensitised to violence and injuries which contributes to the under-reporting of violence and injuries. With all these statistics not being reported, the statistics of SA give a much skewed picture of violence and injuries in SA. This presents a major challenge for policy-makers and stakeholders responsible for promoting social justice, solidarity, harmony and equality within and among South Africans. The focus of this under-reporting should be brought to the attention of relevant stake holders.

There is a need for a more in-depth understanding of violence and injuries not only using quantitative data but also qualitative data.

## **CONCLUSION**

Over the 10 year period violence and injuries only increased significantly in 2010 compared to 2005 and 2015. The most reported event for all 3 time periods was falls. MVAs were the second most reported as individual injuries. However the number of MVAs was very low in the 10 year period. The data from this study regarding MVA correlates well with the overall statistics of SA as the second leading cause of deaths and DALY's, even though the statistics were not that high in the rural community. Although the reporting of violent acts was low, the participants indicated that they thought violent acts had increased. The household statistics, however, indicated a higher report of violent acts than individual injuries. Over the 10 year period the same violent acts reported by participants had increased, even though violent acts were under-reported in the questionnaires at individual injuries. This shows that there is a problem in the community regarding violence and it should be further researched. More emphasis should be placed on the importance of reporting violent acts in rural areas and relevant stakeholders regarding violence and injuries services should be identified to improve reporting and help services.

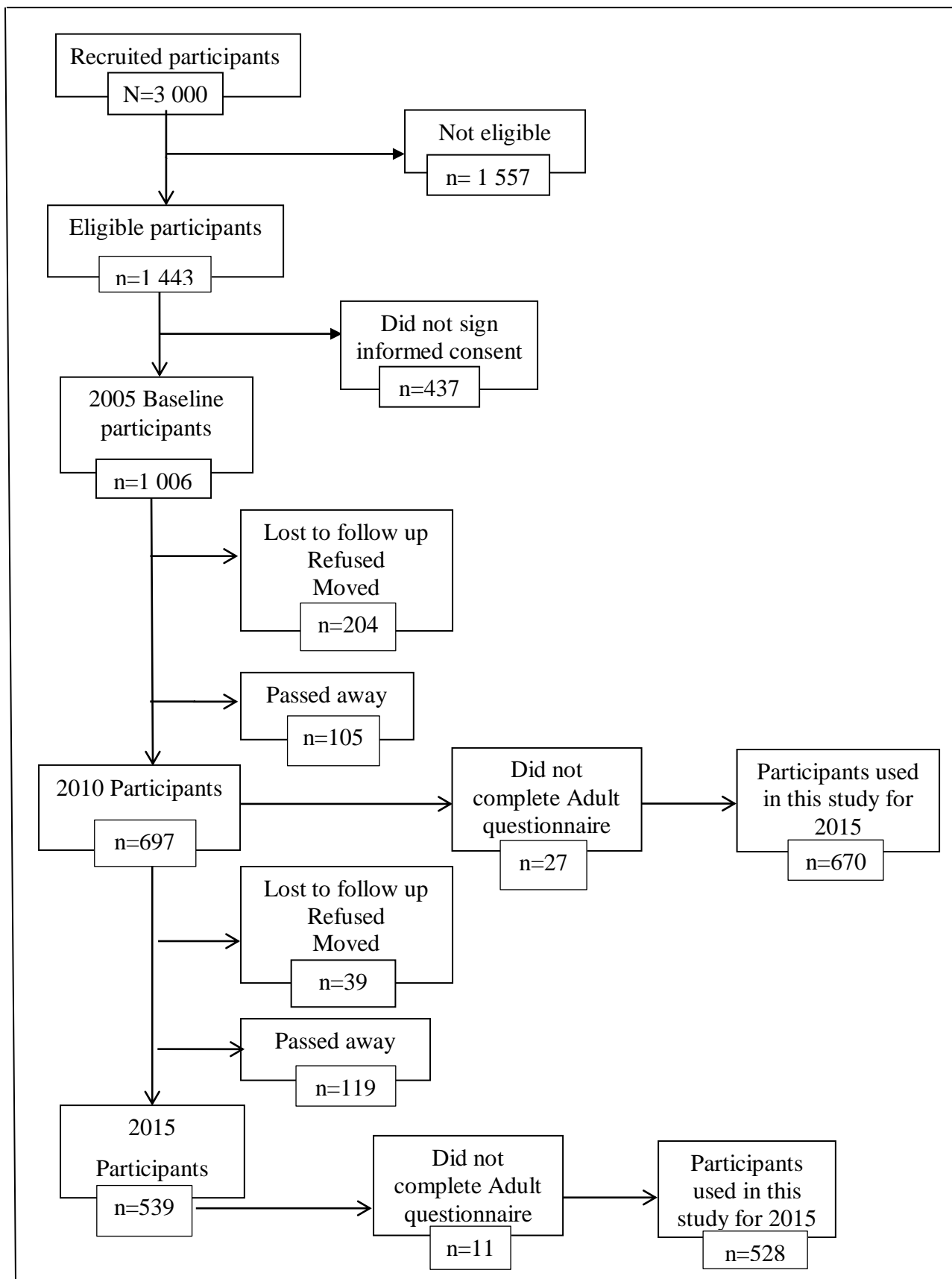
## REFERENCES

- Aschengrau, A. & Seage, G.R. (2014). *Epidemiology in public health* (3<sup>rd</sup> ed.). Burlington, MA: Jones & Bartlett Learning.
- Baier, D. & Prätör, S. (2016). 4. Adolescents as victims of violence. In D. Baier & C. Pfeiffer (Eds.), *Representative studies on victimization. Research findings from Germany* (pp. 65-108). Baden-Baden, Germany: Nomos.
- Berry, S.D. & Miller, R.R. (2008). Falls: epidemiology, pathophysiology, and relationship to fracture. *Current Osteoporosis Reports*, 6(4), 149-154.
- Brown, D.W. (2008). Economic value of disability-adjusted life years lost to violence: Estimates for WHO member states. *Revista Panamericana de Salud Pública*, 24(3), 203-209.
- Centre for Disease Control (CDC). (2016). Intimate partner violence: Risk and protective factors. Retrieved from <http://www.cdc.gov/violenceprevention/intimatepartnerviolence/riskprotectivefactors.html>
- Chang, V.C. & Do, M.T. (2015). Risk factors for falls among seniors: Implications of gender. *American Journal of Epidemiology*, 181(7), 521-531.
- Crais, C. 2011a. *Poverty, war, and violence in South Africa*. Cape Town, South Africa: Cambridge University Press.
- Crais, C. 2011b. *Poverty, war and violence in South Africa*. New York, NY:Cambridge university press.
- Donnermeyer, J., Scott, J. & Barclay, E. (2013). How rural criminology informs critical thinking in criminology. *International Journal for Crime, Justice and Social Democracy*, 2(3), 69-91.
- Donson, H. (2008). *A profile of fatal injuries in South Africa 2007*. Johannesburg, South Africa: South African Medical Research Council. Retrieved from <http://www.mrc.ac.za/crime/nimss07.PDF>
- Doolan, K., Ehrlich, R. & Myer, L. (2007). Experience of violence and socioeconomic position in South Africa: a national study. *Plos One*, 2(12), e1290.
- Dr. Kenneth Kaunda District Municipality. (2016). *IDP REVIEW 2015/16 (IDP 2012-2016)*. Klerksdorp, South Africa. Retrieved from <file:///C:/Users/NWUUser/Downloads/dr%20kenneth%20kaunda%20idp%20review%202015%20final.pdf>
- Elrod, P. & Ryder, R.S. (2013). *Juvenile justice: A social, historical, and legal perspective* (4<sup>th</sup> ed.). Burlington, MA: Jones & Bartlett Publishers.

- Flury, M., Nyberg, E. & Riecher-Rössler, A. (2010). Domestic violence against women: Definitions, epidemiology, risk factors and consequences. *Swiss Medical Weekly*, 140(6), 1-6.
- Garrib, A., Herbst, A.J., Hosegood, V. & Newell, M.L. (2011). Injury mortality in rural South Africa 2000–2007: Rates and associated factors. *Tropical Medicine & International Health*, 16(4), 439-446.
- Gopaul, M. (2009). *The significance of rural areas in South Africa for tourism development through community participation with special reference to Umgababa, a rural area located in the province of KwaZulu-Natal*. (Unpublished doctoral dissertation), University of South Africa, Pretoria, South Africa.
- Gwanya, T. (2010). *South Africa position paper on rural development: A model for the Comprehensive Rural Development Programme*. Pretoria, South Africa: Department of Rural Development and Land Reform. Retrieved from [http://www.rimisp.org/wp-content/uploads/2010/05/Paper\\_T.T\\_Gwanya.pdf](http://www.rimisp.org/wp-content/uploads/2010/05/Paper_T.T_Gwanya.pdf)
- Gyedu, A., Nakua, E., Otupiri, E., Mock, C., Donkor, P. & Ebel, B. (2014). Incidence, characteristics and risk factors for household and neighbourhood injury among young children in semiurban Ghana: A population-based household survey. *Injury Prevention*, 21(e1), 71-79.
- Haegerich, T.M. & Dahlberg, L.L. 2011. Violence as a public health risk. *American Journal of Lifestyle Medicine*, 5(5), 392-406.
- Jina, R. & Thomas, L.S. 2013. Health consequences of sexual violence against women. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 27(1), 15-26.
- Joubert, J., Ziemke, D. & Nagel, K. 2015. *Accessibility in a post-apartheid city: Comparison of two approaches for the computation of accessibility indicators*. Paper presented at the 55th Congress of the European Regional Science Association, Lisbon, Portugal. [https://www.econstor.eu/bitstream/10419/124843/1/ERSA2015\\_01614.pdf](https://www.econstor.eu/bitstream/10419/124843/1/ERSA2015_01614.pdf)
- Kiser, M., Escamilla, V., Samuel, J., Eichelberger, K., Mkwaila, J., Cairns, B. & Charles, A. (2013). Sex differences in interpersonal violence in Malawi: Analysis of a hospital-based trauma registry. *World Journal of Surgery*, 37(12), 2972-2978.
- Krug, E.G., Sharma, G.K. & Lozano, R. (2000). The global burden of injuries. *American Journal of Public Health*, 90(4), 523-526.
- Lanier, C. & Maume, M.O. (2009). Intimate partner violence and social isolation across the rural/urban divide. *Violence against Women*, 15(11), 1311-1330.
- Lehohla, P. & Shabalala, N. (2014). Inequality in South Africa. *Development*, 57(3), 497-511.

- London, L. (2013). Human rights, environmental justice, and the health of farm workers in South Africa. *International Journal of Occupational and Environmental Health*, 9(1), 59-68.
- Marquez, P.V. & Farrington, J.L. (2013). *The challenge of non-communicable diseases and road traffic injuries in sub-Saharan Africa: An overview*. Washington, DC: The World Bank
- Matzopoulos, R., Bowman, B., Mathews, S. & Myers, J. (2010). Applying upstream interventions for interpersonal violence prevention: An uphill struggle in low-to middle-income contexts. *Health Policy*, 97(1), 62-70.
- Norton, R. & Kobusingye, O. (2013). Injuries. *New England Journal of Medicine*, 368(18), 1723-1730.
- Rao, H. (2012). Use of secondary prevention drugs for cardiovascular disease in the community in high-income, middle-income, and low-income countries (the PURE Study): A prospective epidemiological survey. *Indian heart journal*, 64(1), 113-113.
- Rapp, D., Zoch, B., Khan, M.M.H., Pollmann, T. & Krämer, A. (2012). Association between gap in spousal education and domestic violence in India and Bangladesh. *BMC public health*, 12(1), 467-475.
- Roush, K. (2014). *The experience of intimate partner violence in the context of the rural setting*. New York, NY: New York University Press.
- Sethi, D. (2006). *Injuries and violence in Europe: Why they matter and what can be done*. Marmovej, Denmark: World Health Organization. Retrieved from [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0005/98762/E88037.pdf](http://www.euro.who.int/__data/assets/pdf_file/0005/98762/E88037.pdf)
- Sherriff, B., MacKenzie, S., Swart, L.-A., Seedat, M.A., Bangdiwala, S.I. & Ngude, R. (2015). A comparison of urban–rural injury mortality rates across two South African provinces, 2007. *International Journal of Injury Control and Safety Promotion*, 22(1), 75-85.
- South African Medical Research Council (SAMRC). (2016). *National Injury Mortality Surveillance System (NIMSS)*. Retrieved from <http://www.mrc.ac.za/crime/nimss.htm>  
Date of access: 07 Oct. 2016.
- SPSS, I. (2013). SPSS statistical software. Armonk, NY: IBM Corporation.
- Statistics South Africa. 2014. *Mortality and causes of death in South Africa, 2013: Findings from death notification*.
- Teo, K., Chow, C.K., Vaz, M., Rangarajan, S. & Yusuf, S. (2009). The Prospective Urban Rural Epidemiology (PURE) study: Examining the impact of societal influences on chronic noncommunicable diseases in low-, middle-, and high-income countries. *American Heart Journal*, 158(1), 1-7.

- Van Niekerk, A., Suffla, S. & Seedat, M. (2008). Crime, violence and injury prevention in South Africa: Data to action. Medical Research Council, University of South Africa. Retrieved from <http://www.mrc.ac.za/crime/2ndreviewchapter1.pdf>
- Vidyavathi, G. (2015). Consequences and cost of domestic violence. *International Journal of Multidisciplinary Advanced Research Trend*, 2(2), 73-78.
- Wallace, P.H. & Roberson, C. (2016). *Family violence: Legal, medical, and social perspectives*. New York, NY: Routledge.
- World Health Organisation. (2002). World report on violence and health: WHO Geneva. Retrieved from [http://apps.who.int/iris/bitstream/10665/42495/1/9241545615\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/42495/1/9241545615_eng.pdf)
- World Health Organisation. (2014a). *Injuries and violence: the facts 2014*. Retrieved from [http://apps.who.int/iris/bitstream/10665/149798/1/9789241508018\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/149798/1/9789241508018_eng.pdf)
- World Health Organisation. (2014b). *Global status report on violence and prevention*. Retrieved from [http://www.who.int/violence\\_injury\\_prevention/violence/status\\_report/2014/en/](http://www.who.int/violence_injury_prevention/violence/status_report/2014/en/)
- WHO. (2015). Definition and typology of violence. Retrieved from <http://www.who.int/violenceprevention/approach/definition/en/>
- Wolf, A., Gray, R. & Fazel, S. 2014. Violence as a public health problem: An ecological study of 169 countries. *Social Science & Medicine*, 104, 220-227.
- Yusuf, S., Islam, S., Chow, C.K., Rangarajan, S., Dagenais, G., Diaz, R., . . . Avezum, A. (2011). Use of secondary prevention drugs for cardiovascular disease in the community in high-income, middle-income, and low-income countries (the PURE Study): A prospective epidemiological survey. *The Lancet*, 378(9798), 1231-1243.



**Figure 3-2: Participant recruitment for PURE-SA rural area**

**Table 1 Demographic characteristics of participants**

	2005			2010			2015		
	Male (n=348)	Female (n=658)	Total (N=1006)	Male (n=214)	Female (n=456)	Total (N=670)	Male (n=152)	Female (n=376)	Total (N=528)
<b>Age (yrs.)</b>	48± 10.32	49.5± 9.69	49.01± 9.97	55± 9.75	53.3± 9.65	54.14± 9.73	59.61± 7.68	58.01± 8.46	58.48±8.86
<b>Currently employed (%)</b>									
Not answered	59.2	62.2	61.1	1.4	2.2	1.9	-	-	-
Yes	3.2	2.7	2.9	9.3	6.1	7.2	2.6	5.3	4.5
No	37.6	35.1	36.0	89.3	91.2	90.6	97.4	94.7	99.2
<b>Level of education (%)</b>									
Not answered	3.4	3.2	3.3	-	0.4	0.2	-	-	-
None	52.0	46.7	48.5	48.6	43.9	45.4	34.9	25.3	28.0
Primary	29.6	29.5	29.5	32.2	33.1	32.8	55.9	58.0	57.4
Secondary/high school	13.8	20.4	18.1	18.7	22.4	21.2	8.6	16.8	13.8
College/University	0.9	0.2	0.4	0.5	-	0.1	-	-	-
<b>Marital Status (%)</b>									
Not answered	2.9	2.6	2.7	0.9	0.7	0.7	-	-	-
Never married	31.4	35.1	34.2	20.1	29.2	26.3	26.3	25.5	25.8
Currently married	36.0	33.7	34.5	42.1	34.2	36.7	42.1	39.4	14.8
Living with partner/common law	20.5	14.9	16.8	19.2	13.4	15.2	18.4	13.6	40.1
Widowed	4.3	9.1	7.5	9.3	17.3	14.7	18.6	5.3	2.8
Separated	4.0	2.6	3.1	5.6	3.7	4.3	5.3	1.9	15.0
Divorced	0.9	1.4	1.2	2.8	1.5	1.9	2.6	1.1	1.5
<b>Are you currently using alcohol (%)</b>									69.8
Yes	51.3	19.1	30.2	50.5	77.5	68.9	27.2	24.5	27.2
No	48.7	80.9	69.8	44.8	16.8	25.7			

**Table 2 Violence and injuries on individual level**

	2005			2010			2015		
	Male (n=348)	Female (n=658)	Total (N=1006)	Male (n=216)	Female (n=456)	Total (N=672)	Male (n=150)	Female (n=378)	Total (N=528)
<b>Cause of injury (n)</b>									
Motor vehicle accident (as a passenger)	4	-	4	2	2	4	1	-	1
Motor vehicle accident (as a pedestrian)	3	2	5	-	2	2	1	-	1
Struck by an object	3	1	4	1	1	2	-	-	-
Natural/environmental factors	-	-	-	5	8	13	-	-	-
Poisoning	-	-	-	1	1	2	-	-	-
Fall	4	7	11	15	28	43	1	10	11
Fire/Flames, resultant fumes	2	-	2	3	7	10	-	-	-
Violent crime	1	-	1	3	4	7	-	-	-
Domestic violence	-	1	1	-	2	2	-	1	1
Accident caused by machinery	2	-	2	2	-	2	-	-	-
Attempted suicide	-	-	-	3	3	6	-	-	-
<b>Total</b>	<b>19</b>	<b>12</b>	<b>31 (3.1%)</b>	<b>36</b>	<b>59</b>	<b>95 (14.1%)</b>	<b>3</b>	<b>11</b>	<b>14 (2.7%)</b>

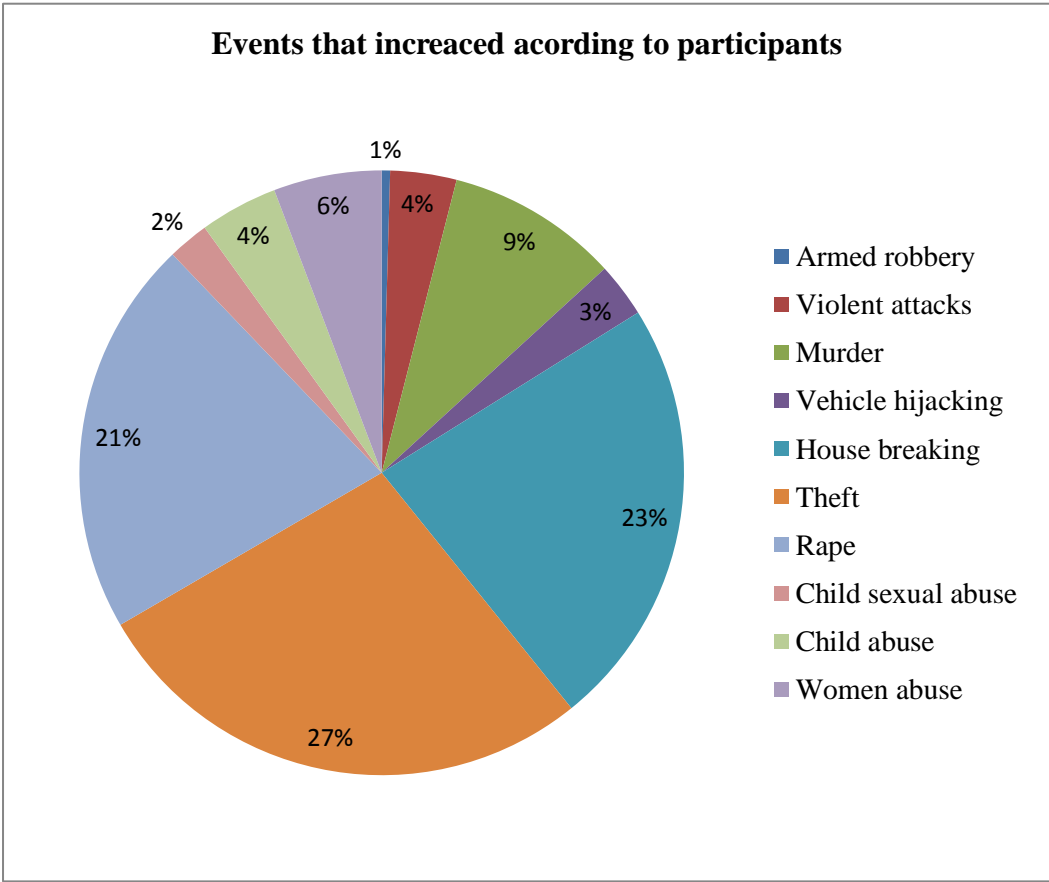
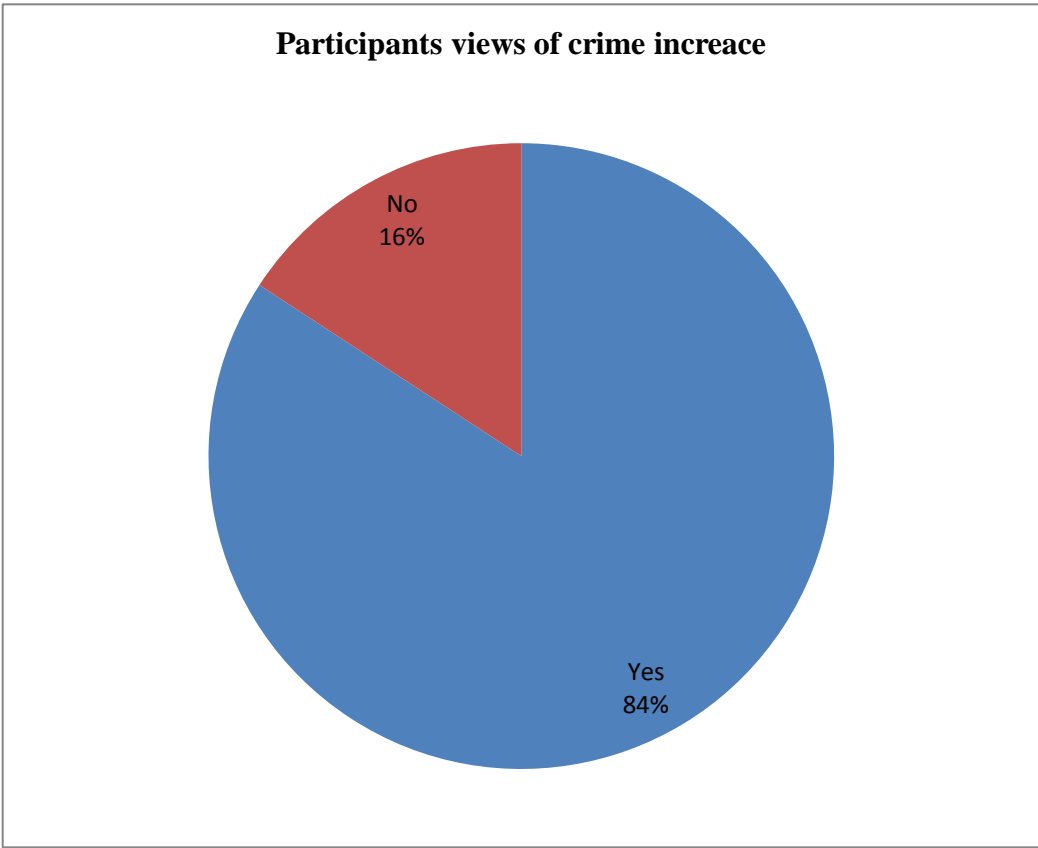
**Table 3 Violence and injuries on household level**

	2005 (N=833)			2010 (N=579)			2015 (N=528)		
	Not answered	Yes	No	Not answered	Yes	No	Not answered	Yes	No
Armed robbery (n)	6	4	823	11	16*	551		3#	525
Violent attacks(n)	6	11	816	12	45*	521		10#	518
Murder (n)	6	5	822	11	19*	549		2 #	526
Vehicle hijacking (n)	6	2	824	12	8*	559		1#	526
House breaking (n)	6	9	818	8	47*	524		8#	519
Theft (n)	6	7	820	6	65*	508		7#	519
Rape (n)	5	8	820	11	16*	551		7#	520
Women abuse eg (beat, swear words, sexual (n)	7	3	823	11	25*	543		5#	522
Child abuse eg (burn, swear word, rejection )(n)	6	3	824	12	10*	557		4	523
Child sexual abuse (n)	12	2	819	13	6	559		4	523
Other, please specify (n)	34	-	799	21	2	556		1	527

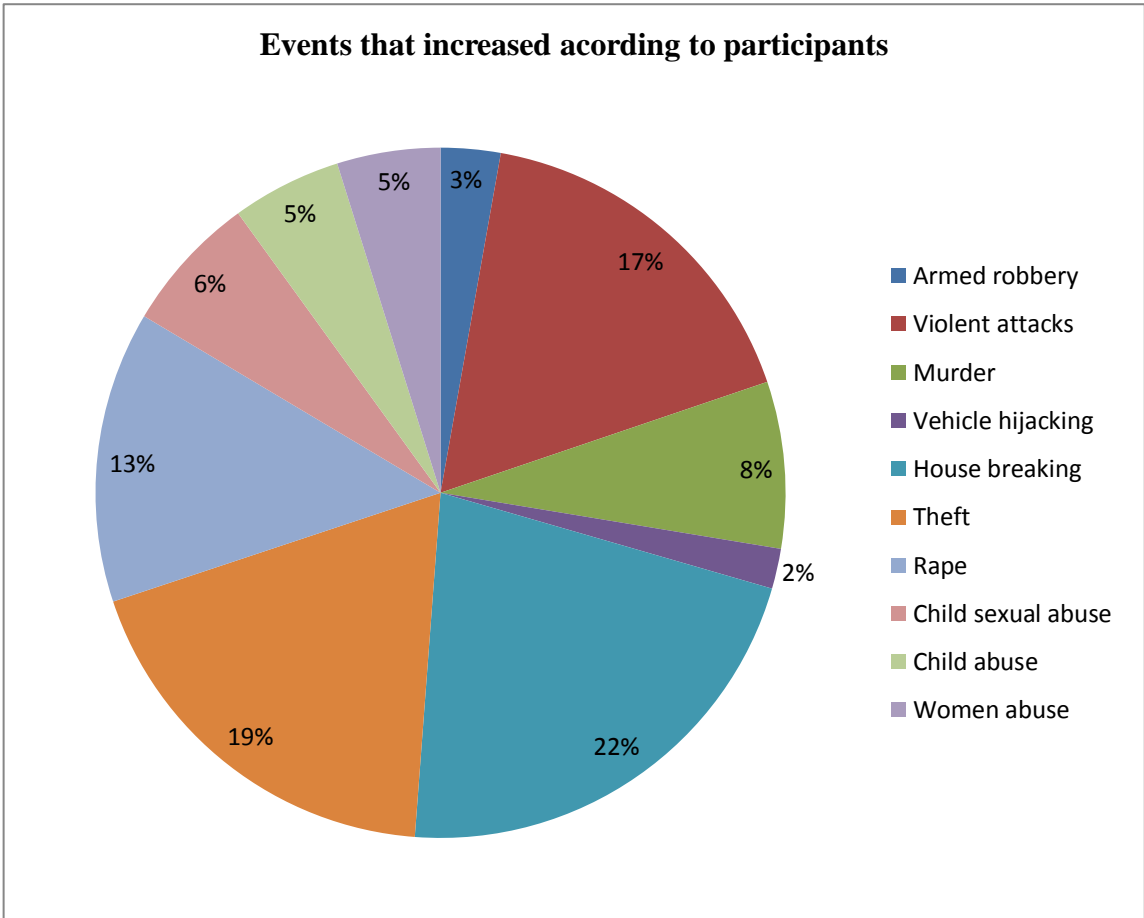
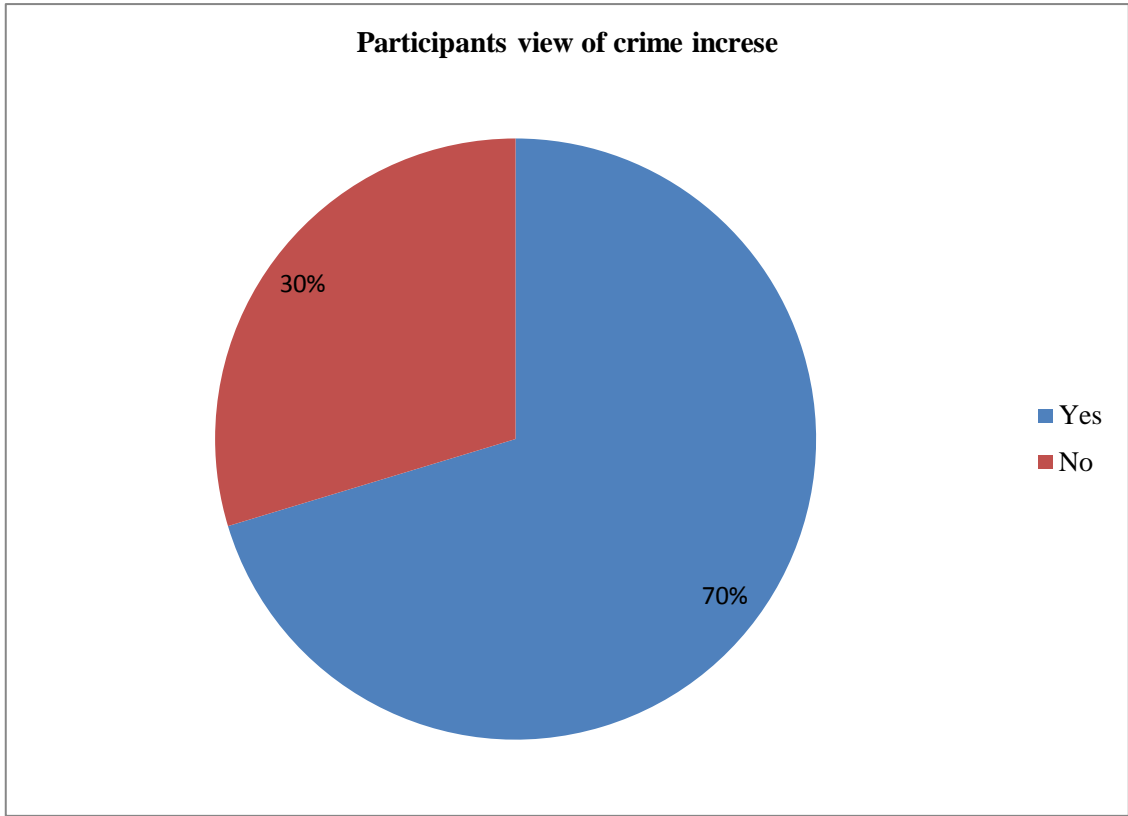
\* Significant difference between 2005 and 2010

# Significant difference between 2010 and 2015

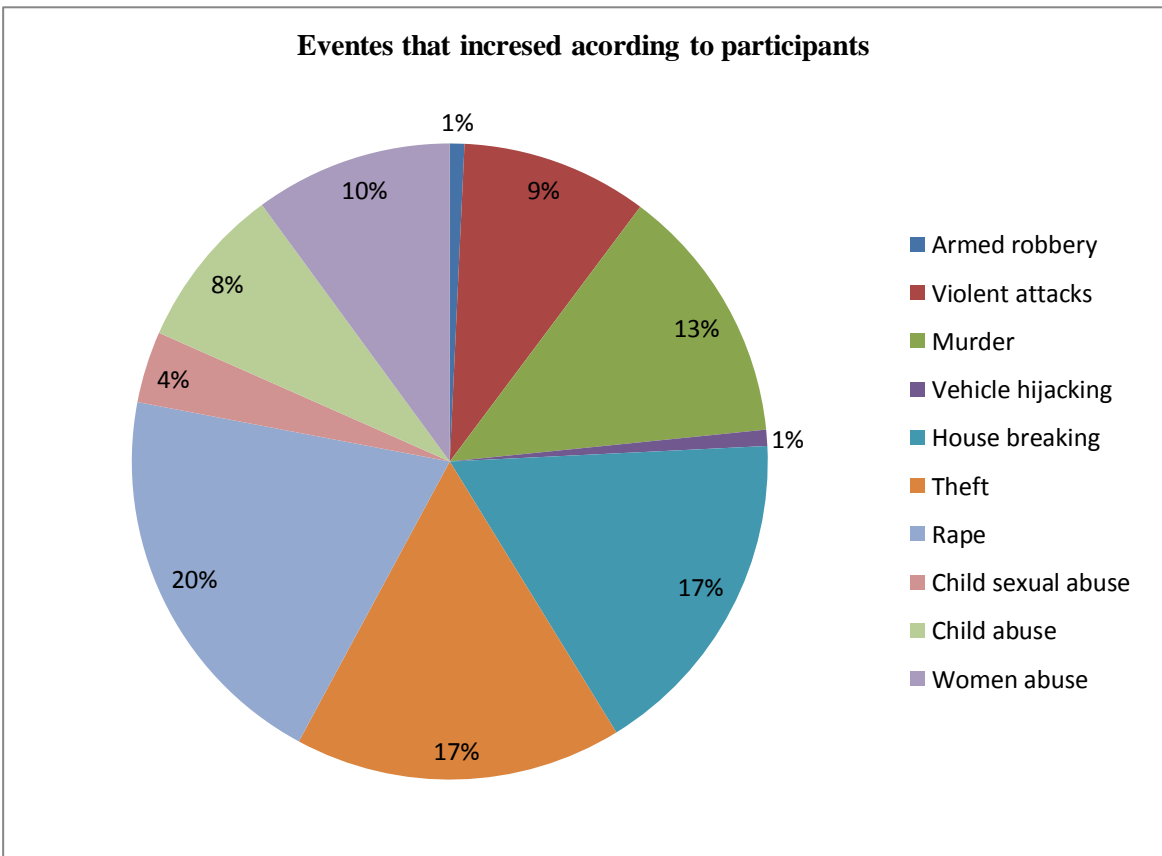
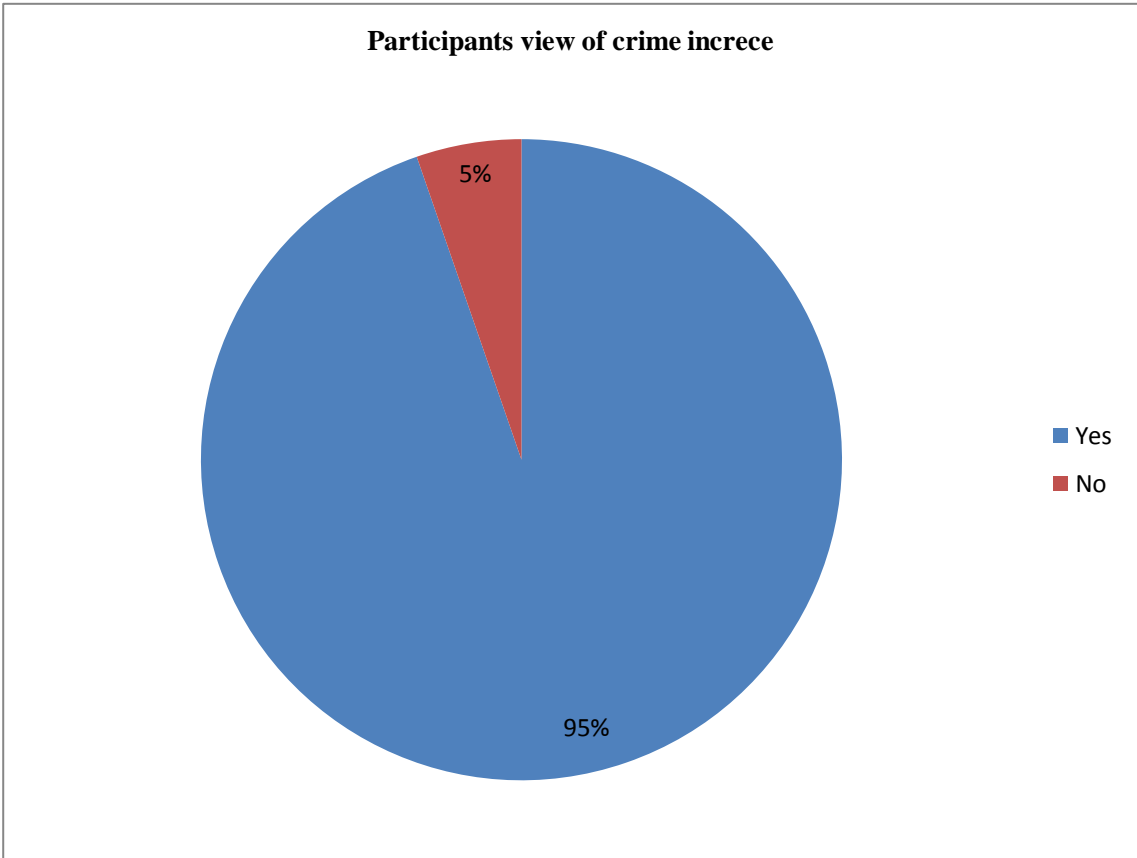
No significant difference between 2005 and 2015 were observed



**Figure 3-2 A: Participants view of violence and injuries in the community in 2005**



**Figure 3-2 B: Participants view of violence and injuries in the community in 2010**



**Figure 3-2 C: Participants view of violence and injuries in the community in 2015**

## CHAPTER 4: CONCLUSIONS AND RECOMMENDATIONS OF STUDY

### 4.1 Introduction

This final chapter provides a summary of the research and the main findings. The results of the study will be discussed, interpreted and compared to the relevant literature in Chapter 3. In the remainder of this section the study will be evaluated. The limitations of the study will be considered as well and recommendations will be made for future research, where after the section will be concluded.

### 4.2 Summary of findings

The top three violence and injury events reported in the 10 year period of this study were two un-intentional injuries (falls and MVA) and violent acts. The most frequent injuries reported were falls. Numerous researchers have studied the risk factor of falling among older adults. The risk factors of falls are divided into four categories: biological, environmental, behavioural, and socioeconomic factors (Dsouza *et al.*, 2014:36). Under biological factors the female sex is widely reported in the literature as being associated with increased risk of falls (Gale *et al.*, 2016; Hu *et al.*, 2015; Li *et al.*, 2013; Williams *et al.*, 2015:9). In the results of this study it was also observed that women were significantly more likely to report fall-related injuries in the previous year than men.

Environmental factors could have contributed to falls in the present community due to a lack of proper infrastructure, poor street lights and uneven sidewalks. Williams *et al.* (2015) found that LMICs, such as SA, shows an increased risk of falls due to environmental factors, such as open street gutters, poor quality footpaths and unsafe walking areas in rural areas. Socioeconomic factors such as having a water source outside the home and having earth flooring in the home were factors significantly associated with fall-related injuries (Williams *et al.*, 2015:9).

Behavioural factors included smoking status, alcohol consumption, physical activity level, and medication use (Chang & Do, 2015:521). In 2010 alcohol consumption in the present community was significantly higher than in 2005 and 2015. In the same year falls increased with 290% from 2005 to 2010. According to Kirby *et al.* (2014:xv) higher alcohol consumption is associated with big sporting events. Therefore the falls may have increased in 2010 because of the soccer world cup.

The present study correlated with results from the overall PURE study that assessed global risk factors for non-fatal injuries from road traffic accidents and falls in adults aged 35–70 years in 17 countries: a cross-sectional analysis of the Prospective Urban and Rural Epidemiological (PURE) study stating that falls were the most reported injury during the study. The same biological factors were associated with falls in the overall PURE study.

Another result that correlated with the overall PURE study was the risk factor for MVAs. The study indicated that in LMICs risk factors for MVAs like poor infrastructure (e.g. roads, traffic signals, street lighting), absence of regulating and implementing safety measures (e.g. seat belt laws, vehicle crash protection) in rural areas may explain the greater odds of MVAs (Raina *et al.*, 2016:3). In the present study MVAs were the second leading cause of injuries in 2005 and 2015.

Although violence was not widely reported in the present study, according to the views of the participants the increase of violent acts and crime is a primary concern to the community. Participants reported that according to them violent acts for example violent attacks, house break-ins, rape and theft had increased over the 10 year period. Insufficient data focusing specifically on rural communities' views of violence increase is available in SA. However the views of the participants in the present study correlate with a victim of crime survey 2015/16 that indicated the overall view of people in SA is the fact that crime and violence are increasing even though the crimes are not reported (Statistics South Africa:2017).

### **4.3 Evaluation**

Evaluation of the study is done by asking the questions whether this research attained the proposed aim and objectives of the study. Furthermore: was the methodology appropriate for the study and lastly evaluating whether the research conducted complied with health research ethics.

#### **4.3.1 Evaluation of the research aim and objectives**

The aim of this study was to describe the trend of violence and injuries among adults aged 35 to 70 years in a rural area within the North-West Province over a period of 10 years, by using the PURE-SA study data. The objectives were to determine the types and frequencies of violence and injuries as baseline and five-year follow-ups (2005, 2010 and 2015) as well as to investigate possible changes in the type and frequencies in violence and injuries over ten years.

The results of the study gave a longitudinal overview (description) of how violence and injuries have been occurring over a period of 10 years, giving five-year interval cross-sectional descriptions of violence and injuries for each year (2005, 2010 and 2015). Therefore it can be concluded that the aims and objectives of this study were met.

#### **4.3.2 Purpose**

Literature regarding violence and injuries in rural areas suggest that little statistical data is available on South African rural communities (Sherriff *et al.*, 2015:76). Data sources that could be used to study prevalent trends in violence only started in 2009 (Mayosi *et al.*, 2012:1013), with little focus on rural communities (Sherriff *et al.*, 2015:76). The rural community at hand is

traditional territory with little infrastructure, no non-governmental organisations or programmes (NGO's) to address violence and injuries. When focusing on the health aspect of violence and injuries this phenomenon has biological, psychological, social and environmental roots combining individual, relationship, social, cultural and environmental factors (Haegerich & Dahlberg, 2011:392; WHO, 2002:12). However, there is lack of literature on how violence and injuries have evolved over time among a rural population. This prevents intervention programmes developed for violence and injuries from being adjusted for rural communities. It also establishes the need for violence and injury education in rural areas.

The description given on the occurrence of violence over a long period of time will serve as a benchmark for interventions or future studies on violence and injuries leading to appropriate educational interventions.

#### **4.3.3 Appropriateness of the methodology**

As seen in chapter 2 violence and injuries have multiple effects. A longitudinal study design is used when researchers wish to learn about multiple effects of an exposure (Aschengrau & Seage, 2014:226). The descriptive data given in this study can be used to develop hypotheses or recommendations for future studies (Sedgwick, 2013:2). For example further in-depth research can be done to identify the specific requirements for services that need to be provided in rural areas to combat violence and injuries.

#### **4.3.4 Rigor and health research ethics**

The study was part of the larger multinational PURE study; the same questionnaires were used globally within each country participating within the PURE study. To enable cross-country comparison it was essential that each country used the same questionnaire. Hence the content of the questionnaires could not be adapted in any way. The quality of the data was standardised by making use of a comprehensive operations manual, periodic training workshops, training DVD's, and regular communication with the coordinating office in Canada. All data were entered in a customised database programmed with range and consistency checks and transmitted electronically to the Project Office at the Population Health Research Institute in Hamilton (ON, Canada) where further quality control measures were implemented (Teo *et al.*, 2009:3). Quality of data collection was maintained through the use of standardised protocols and centralised training (Teo *et al.*, 2009:3). All of the researchers and assistants that were part of this study were all experienced in their fields and all staff members were standardised in terms of data collection and completion of questionnaires prior to the study. The fieldworkers were re-trained intensively every time prior to any form of data collection (Teo *et al.*, 2009:4).

#### **4.4 Limitations of the study**

The use of standardised questionnaires developed in Canada, was a limitation to the study because the questionnaires were not context-specific. Another limitation identified was the large number of participants lost during the 10 year period. The large number of participants lost in the follow-up was due to the time period of the longitudinal study. Although the follow-up rates should be as high as possible in order to ensure the validity of study (Aschengrau & Seage, 2014:210), the data obtained are very necessary and valuable and the follow up rate is still good for a 10 year study.

#### **4.5 Recommendations for future research and practical applications**

The most reported violence and injury events in the 10 year period of this study were falls, MVA and violent acts. These violence and injury risk factors can all be divided within the social-ecological model. The four different levels individual, relationships, community and society identify the risk factors and the focuses of the recommendations of the study on each level.

##### **4.5.1 Recommendations at individual and relationship level**

Recommendations formulated on individual and relationship levels were as follows:

- On an individual level, it is recommended that there should be a stronger awareness of the influence that violence and injuries can have on one's overall health.
- Individuals can be informed through health education of basic changes in their daily living environment to limit falls, for example, to do a tour around a house and identify fall risks and rectify these risks as part of a group activity.
- Activate a support system programme for personal and household safety within communities, including the way to access reporting systems (like having the telephone numbers of the police, hospital etc.).
- An awareness campaign can be conducted to inform people about the causes and risk factors of violence and injuries within relationships and the possibility of forming support systems.
- Educational workshops can be provided on violence and injuries happening with households and the risk factors thereof.

##### **4.5.2 Recommendations at community and societal level**

The recommendations for violence and injuries on a community and societal level:

- A valid, real-time and dynamic database of actual reports on violence and injuries to provide all stakeholders with access to accurate data.

- Research needs to be conducted in the form of a qualitative study on how participants in this community perceive violence and injuries.
- A transdisciplinary approach needs to be taken in research for developing a rural-specific intervention regarding community health and safety. For example, local radio stations and newspapers can report on how to prevent violence and injuries.
- More focus should be placed on making people aware of the different help services available to victims in the community.
- The rural community at hand can be made safer by incorporating the age- friendly community initiative, for instance providing paved walks and street lights.

#### **4.6 Conclusion**

There is a lot of room for improvement and research regarding violence and injuries in this community as well as in SA as a whole. Collecting data regarding violence and injuries and the people's views of crime increase is a start to understand violence and injuries in a rural area about which little is known. The views of the participants suggest that there is an indication of violence progressing in the community although it is not widely reported. The PURE-SA study only focused on a portion of community members therefore the results cannot be generalised to the whole SA. However, the longitudinal study provided descriptive data which can be used as a standard to facilitate transdisciplinary collaboration in addressing violence and injuries. By starting in one community the whole SA can be improved one community at a time.

#### 4.7 References

- Aschengrau, A. & Seage, G.R. 2014. Essentials of epidemiology in public health. 3rd ed. Sudbury, Mass.: Jones & Bartlett Learning.
- Chang, V.C. & Do, M.T. 2015. Risk factors for falls among seniors: implications of gender. *American journal of epidemiology*, 181(7):521-531.
- Dsouza, S.A., Rajashekar, B., Dsouza, H. & Kumar, K. 2014. Falls in Indian older adults: a barrier to active ageing. *Asian journal of gerontology and geriatrics*, 9(1):1-8.
- Gale, C.R., Cooper, C. & Sayer, A.A. 2016. Prevalence and risk factors for falls in older men and women: the English longitudinal study of ageing. *Age and ageing*, 45(6):789-794.
- Hu, J., Xia, Q., Jiang, Y., Zhou, P. & Li, Y. 2015. Risk factors of indoor fall injuries in community-dwelling older women: a prospective cohort study. *Archives of gerontology and geriatrics*, 60(2):259-264.
- Kirby, S., Francis, B. & O'Flaherty, R. 2014. Can the FIFA world cup football (soccer) tournament be associated with an increase in domestic abuse? *Journal of research in crime and delinquency*, 51(3):259-276.
- Li, Y.H., Song, G.X., Yan, Y., De Ding, Z. & Zhang, H.W. 2013. Study on age and education level and their relationship with fall-related injuries in Shanghai, China. *Biomedical and environmental sciences*, 26(2):79-86.
- Raina, P., Soheli, N., Oremus, M., Shannon, H., Mony, P., Kumar, R., *et al.* 2016. Assessing global risk factors for non-fatal injuries from road traffic accidents and falls in adults aged 35-70 years in 17 countries: a cross-sectional analysis of the Prospective Urban Rural Epidemiological (PURE) study. *Injury prevention*, 22(2):92-98.
- Sherriff, B., MacKenzie, S., Swart, L.-A., Seedat, M.A., Bangdiwala, S.I. & Ngude, R. 2015. A comparison of urban-rural injury mortality rates across two South African provinces, 2007. *International journal of injury control and safety promotion*, 22(1):75-85.
- Stats SA. 2017. Victims of Crime Survey 2015/16. Pretoria.
- Stewart Williams, J., Kowal, P., Hestekin, H., O'Driscoll, T., Peltzer, K., Yawson, A., *et al.* 2015. Prevalence, risk factors and disability associated with fall-related injury in older adults in low-and middle-income countries: results from the WHO Study on global AGEing and adult health (SAGE). *BMC medicine*, 13(1):147.
- Teo, K., Chow, C.K., Vaz, M., Rangarajan, S. & Yusuf, S. 2009. The Prospective Urban Rural Epidemiology (PURE) study: examining the impact of societal influences on chronic noncommunicable diseases in low-, middle-, and high-income countries. *American heart journal*, 158(1):1-7. e1.
- WHO (World Health Organization). 2002. World report on violence and health. Geneva: WHO.

**ANNEXURE A: PURE QUESTIONNAIRE**

**PURE**

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**9 YEAR FOLLOW-UP VISIT  
PARTICIPANT QUESTIONNAIRE**

**INSTRUCTIONS**

Please answer EACH question by marking  
an X in ONE BOX on each line:  
(unless otherwise instructed)



OR

By writing number(s) in the spaces provided:



OR

By specifying the answer on the line(s) provided

# Adult Questionnaire

## 8. Occupation

### Group 1: Legislators, senior officials and managers

Legislators and senior officials  
Corporate managers  
General managers  
Businessman

### Group 2: Professionals

Physical, mathematical and engineering science professionals  
Life science and health professionals  
Teaching professionals  
Other professionals

### Group 3: Technicians and associate professionals

Physical, mathematical and engineering- science associate professionals/technicians  
Life science and health associate professionals/technicians  
Teaching associate professionals/technicians  
Other associate professionals/technicians

### Group 4: Clerks

Clerks  
Customer service clerks

### Group 5: Service workers and shop and market sales workers

Personal and protective services workers  
Models, salespersons and demonstrators

### Group 6: Skilled agricultural and fishery workers

Market-oriented skilled agricultural and fishery workers  
Subsistence agricultural and fishery workers

### Group 7: Craft and related trade workers

Extraction and building trade workers  
Metal, machinery and related trades workers  
Precision, handicraft, printing and related trades workers  
Other craft and related trades workers

### Group 8: Plant and machine operators and assemblers

Stationary plant and related operators  
Machine operators and assemblers  
Drivers and mobile plant operators

### Group 9: Elementary occupations

Sales and services elementary occupations  
Agricultural, fishery and related labourers  
Labourers in mining, construction, manufacturing and transport

### Group 10: Armed forces

Armed forces

### Group 11: Homemaker

Housewife/Househusband

## Adult Questionnaire

### 18. Accidents and Injuries

#### Location of Injury

- 1= Factory/industrial place
- 2= Office
- 3= Agriculture field/farm
- 4= Home
- 5= Road
- 6= Sport/game e.g. track, court, field, etc.
- 7= Public building
- 8= Mine/quarry
- 9= Construction site e.g. building, road-works, etc.
- 10 = Other

#### Type of Injury

- 1= Burns
- 2= Scalds
- 3= Fractures
- 4= Muscle and ligament sprains/tears
- 5= Cuts and lacerations
- 6= Bruises and abrasions
- 7= Suffocation
- 8= Head injury (where person did not lose consciousness)
- 9= Head injury (where person lost consciousness for some time)

Subject ID

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Centre #	Community#	Household #	Subject #

Subject Initials

F M L

18. During the past 12 months, have you had any injuries that were serious enough to limit your normal activities? (check all that apply)

No → Go to #19     Yes → answer 18a – 18s

If yes, please provide details:

Please refer to facing page for Location and Type Codes  
Absence from work or usual activities (Days)

Cause of injury

			Location	Type	usual activities (Days)
a) Motor vehicle accident (as a passenger)	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
b) Motor vehicle accident (as a pedestrian)	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="text"/>	<input type="text"/>	<input type="text"/>
c) Struck by an object	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="text"/>	<input type="text"/>	<input type="text"/>
d) Explosion	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
e) Natural/environmental factors (gales/cyclones/lightning, etc.)	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
f) Suffocation	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
g) Poisoning	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
h) Snake/scorpion bite	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
i) Fall	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
j) Fire/flames, resultant fumes	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
k) Physical assault (gun, kidnapping, etc.)/violent crime	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
l) Domestic violence (beaten by a family member)	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
m) Drowning/submersion	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
n) Hot or corrosive liquids/floods/substances	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
o) Crush injuries (boulders, building materials, etc.)	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
p) Accident caused by machinery	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
q) Attempted suicide	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
r) Armed conflict	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>
s) Other(specify) _____	<input type="checkbox"/> No	<input type="checkbox"/> Yes →	<input type="text"/>	<input type="text"/>	<input type="text"/>





Subject ID

Centre #    Community#    Household #    Subject #

Subject Initials

F    M    L

27. Are you a member of any of the following:

How often do you participate in the activities of this group?

			Per Month	OR	Per Year
(i) Self help group, Co-operative, Social club, Sports club,	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→ <input type="text"/>		<input type="text"/>
(ii) Religious Group (e.g: church group, etc.)	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→ <input type="text"/>		<input type="text"/>
(iii) Other _____ <i>Specify</i>	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→ <input type="text"/>		<input type="text"/>

28. Please answer the following: (choose only one option for each)

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
(i) People are generally honest and want to help others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(ii) If I do nice things for someone, I can anticipate that they will respect me and treat me just as well as I treat them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30. In a difficult situation, whose help can you count on from? (Please see facing page for definitions)

(i) Civic organizations: specify \_\_\_\_\_

none     little     moderate/average     a great deal

(ii) Religious organizations: specify \_\_\_\_\_

none     little     moderate/average     a great deal

Subject ID

*Centre #    Community#    Household #    Subject #*

Subject Initials

*F    M    L*

31. Have you experienced any of the following events during the last 12 months?

	No response	No	Yes	
(i) Loss of job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(ii) Retirement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(iii) Loss of crop/business failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(iv) Household break in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(v) Marital separation/divorce	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(vi) Other major intra-family conflict	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	→ Please specify _____
(vii) Major personal injury or illness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(viii) Violence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(ix) Armed conflict/war	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(x) Death of a spouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(xi) Death/major illness of another close family member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(xii) Other major stress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	→ Please specify _____
(xiii) Wedding of family member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(xiv) New job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(xv) Birth in the family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(xvi) Separation from family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(xvii) Unavailability of food/ food insecurity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Subject ID

*Centre #    Community#    Household #    Subject #*

Subject Initials

*F M L*

32. Please answer the following: (Choose only one option for each)

For the following question, stress is defined as feeling irritable or filled with anxiety, or as having sleeping difficulties as a result of conditions at work or at home.

	No response	Never Experienced Stress	Some Period of Stress	Several Periods of Stress	Permanent Stress
a) How often have you felt stress at work in the last 12 months? (Mark here if not applicable: i.e. no longer working <input type="checkbox"/> )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) How often have you felt stress at home in the last 12 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. What level of financial stress have you felt in the last 12 months?

No response   
  Little/none   
  Moderate   
  High/severe

Subject ID

*Centre # Community# Household # Subject #*

Subject Initials     
*F M L*

35. Please answer the following: (Choose only one option for each)

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
a) I can do most of my regular shopping (food, household necessities, etc.) at stores within easy walking distance (less than 15 minutes) of my home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Walking or bicycling in my neighbourhood is difficult because of the speed and/or amount of traffic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) My neighbourhood is generally free from pollution (litter, air pollution and noise pollution).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) My neighbourhood streets are well lit at night.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) I can see other people when I am walking in my neighbourhood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) I can speak to other people when I am walking in my neighbourhood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) There is a high crime rate in my neighbourhood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) There is a problem with unattended dogs in my neighbourhood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Subject ID

*Centre #    Community#    Household #    Subject #*

Subject Initials

*F   M   L*

36. Please answer the following: (Please check all that apply)

i) Has your household been a victim of the following crime(s) in the last 12 months?

	No	Yes
1. Armed robbery	<input type="checkbox"/>	<input type="checkbox"/>
2. Violent attacks	<input type="checkbox"/>	<input type="checkbox"/>
3. Murder	<input type="checkbox"/>	<input type="checkbox"/>
4. Vehicle hijacking	<input type="checkbox"/>	<input type="checkbox"/>
5. House breaking	<input type="checkbox"/>	<input type="checkbox"/>
6. Theft	<input type="checkbox"/>	<input type="checkbox"/>
7. Rape	<input type="checkbox"/>	<input type="checkbox"/>
8. Women abuse eg. (beat,swear-words,sexual) please specify _____	<input type="checkbox"/>	<input type="checkbox"/>
9. Child abuse eg. (burn,swear-words,rejection) please specify _____	<input type="checkbox"/>	<input type="checkbox"/>
10. Child sexual abuse	<input type="checkbox"/>	<input type="checkbox"/>
11. Other, please specify _____	<input type="checkbox"/>	<input type="checkbox"/>

ii) Do you think that crime in your area has increased in the past 5 years?

No     Yes

if yes, which of the following crime(s)?

- Armed robbery
- Violent attacks
- Murder
- Vehicle hijacking
- House breaking
- Theft
- Rape
- Women abuse
- Child abuse
- Child sexual abuse
- Other, please specify \_\_\_\_\_

Subject ID

Centre # Community# Household # Subject #

Subject Initials   
F M L

37. Questions on HIV:

(i) Do you know people who have HIV/AIDS?  No  Yes

if yes, which of these people: (please mark all that apply)

- Your children
- Your grandchildren
- Your spouse
- Your family members
- Your friends
- People in the community

(ii) What would you consider the mean age of the people who are ill/have died of HIV/AIDS? Tick only one block.

- Younger than 10 years
- Between 11-20 years
- Between 21-30 years
- Between 31-40 years
- Between 41-50 years
- Over 50 years

(iii) If someone in your household is HIV positive, who is the primary caregiver? Tick only one block.

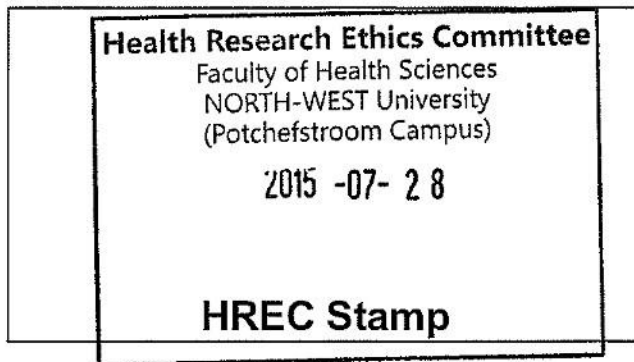
- Spouse
- Parents
- Family member
- Child.children
- Friends
- Volunteer

38. Do you care for any orphans in your family?  No  Yes

## **ANNEXURE B: INFORMED CONSENT FORM.**



NORTH-WEST UNIVERSITY  
YUNIBESITHI YA BOKONE-BOPHIRIMA  
NOORDWES-UNIVERSITEIT  
POTCHEFSTROOM CAMPUS



### **INFORMATION LEAFLET AND WRITTEN INFORMED CONSENT FORM FOR PARTICIPANTS OF THE PURE STUDY**

**TITLE OF THE RESEARCH PROJECT: Prospective Urban and Rural Epidemiology  
(PURE) study**

**REFERENCE NUMBERS: NWU-00016-10-A1**

**PRINCIPAL INVESTIGATORS: Prof A Kruger and Dr IM Kruger**

**ADDRESS: North-West University (Potchefstroom Campus), Africa Unit for  
Transdisciplinary Health Research (AUTHeR), Building E8, Office G03.**

## **Dear participant**

You have been part of the PURE research since it started in 2005. Whether you took part in the research every year or even only some of the years, we would like to invite you once more to be part of this research.

This information document will provide you with all the information that you need to know about the research. A fieldworker who lives within your community will discuss all of the information in this document with you in order for you to understand why this research is done and why you are invited to be part of this research.

## **What is this research about?**

This research has already started in 2005 and will finish in December 2015. This research study wants to look at different risks to your health and how these risks can develop over time.

What are some of the risks to your health?

- Being too fat (overweight or obese) or too thin (underweight),
- Having high blood pressure (hypertension) or too low blood pressure (hypotension),
- Having too high blood sugar levels (hyperglycaemia) or too low blood sugar levels (hypoglycaemia),

What might cause you to develop some of these risks?

- The type of foods you eat, for example too much salt or too much fat;
- If you don't do any exercise;
- Smoking or using tobacco products;
- Drinking alcohol;
- Some factors (genetic characteristics) that you inherit from your parents or even your grandparents,

## **Why have you been invited to take part in the study?**

You have been invited to be part of the study because:

- In 2005:
  - you were between the ages of 35 and 70 years
  - you were a healthy man or woman

- you did not have any chronic disease or illness
- you permanently lived in a household within the community

Even though you might have developed some illness since 2005, you can still be part of the study. If you are part of the study now we want to see how you are doing.

**Do you have to take part in the study?**

You are not forced to take part in this research. It is important that you understand that you don't have to be part of this research study. You are invited, and therefore you can choose if you want to be part or not. You can agree to be part of the research now and change your mind later. If you do not want to be part of the research anymore, you will not be treated differently and you will not be punished or judged for not wanting to be part of the research.

This research was approved by a group of people (known as a committee) from the North-West University. These people looked at all the procedures of the research to make sure that if you decide to be a part of the research, you will not be hurt or harmed in any way. These people are known as the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University on the Potchefstroom campus. It might happen that during the research one or more of these committee members may come to check that the researchers are keeping to the procedures that was explained to you and no unnecessary procedures are performed on you.

**What will you have to do if you decide to be part of the study?**

If you decide to be part of the study the following will be done:

- A fieldworker that lives within your community will visit you at your house and he / she will explain everything to you and let you ask any questions if you don't understand anything. You will then be given 7 days to think about whether you want to continue to be part of the research.
- If you, after 7 days, agree to continue to be part of the research and you understand everything, you will sign a form, known as a written informed consent form, with the fieldworker.

- Once you have signed the written informed consent form an appointment will be made with you for you to come to the research facility. The date that will be scheduled with you, will be one that suits you the best. All of the arrangements will be made with you to bring you to the place where the research will take place.
- On the day of the appointment one of the taxis involved in the research will pick you up from a place that was arranged with you.
- When you arrive at the place where the research will take place the following will be done with your permission / consent:
  - A small amount of blood (33 ml) will be drawn from the inside of your arm.
  - Your blood pressure will be measured.
  - Your heart function will be checked (electrocardiogram). For us to be able do this test, you will be asked to take off your shirt or blouse to reveal your chest. If you are a women, you are allowed to keep on your underwear. Little round stickers will be placed on your skin all around the area of your heart.
  - The speed that the blood travels through your blood vessels will be measured (pulse wave velocity). This will be done by placing a thing that looks like a pen on the skin of your neck while placing another one on the skin near your pubic area. For us to be able to do this test, the researcher will gently pull down your pants or skirt to reveal just a small area between the inside of your leg and your private area (pubic area) where the pen-like device will be placed.
  - Your blood vessels in your neck will be checked for any blockages or deposits (intima-media thickness) by placing some liquid gel on the skin of your neck and then by using a thing that looks like a torch to take a picture (sonar) of your blood vessels.
  - You will be weighed and your body length will be measured. You will be asked to remove your shoes and all of your extra clothing. You will be allowed to keep on your pants / skirt and your shirt / blouse.
  - The amount of body fat and amount of muscles you have will be measured. You will be asked to remove just your shirt / blouse. If you are a women, you may keep your underwear on. The thickness of your skin on

your stomach, arms and back will be measured using a tong-like instrument. The researcher will pinch the skin between their fingers and place the tong over the skin to measure how thick the skin fold is. A measuring tape will also be used to measure the circumference of your hip, waist and upper arm.

- The amount of fat and muscle will also be measured using a special machine called the Bodpod. You will be asked to climb into the machine and sit on a little bench. A see-through lid will close around you. You will be asked to sit very still and make no movements at all. The machine will blow some air around you and this will then measure the amount of fat and muscle in your body. You will need to wear a tight pants and tight shirt. We will also give you a swimming cap to put on your head while you are in the machine.
- A photo (X-ray) will be taken of your forearm to see if the bones are still hard and strong (bone mineral density).
- Your lung function will be measured. A little plastic pipe will be placed between your lips. Then you have to take a deep breath and blow out the air as hard and as fast as you can through the little pipe.
- You will perform a test to see how strong you're muscles in your hands / forearm (hand grip strength) and legs are (chair stand / rise and walk test). To test how strong your muscles in your hand is you will be asked to squeeze your hand very tight around an instrument with a handle. To test the strength of your muscles in your legs you will have to sit down on a chair and then stand up without using your hands and arms. You will also be asked to walk on a straight line for 6 metres without any help.
- You will complete several questionnaires.
- You will be asked information regarding all the medicines that you currently use.
- You will be asked to give a little bit of urine in a small bottle.
- If you agree and give permission, a HIV test will be performed (If you do not want to be tested for HIV, you can still be part of the study). A needle will be used to prick one of your fingers to get a small drop of blood. This drop of blood will be used to do the HIV test.
- If you are newly diagnosed with HIV, or if you are currently HIV positive we will test your CD4 count. This test will show us how many CD4 cells

there are in your body. These cells keeps your body healthy and prevents you from getting sick. If the number of cells are too low then you will need medicine (anti-retroviral therapy (ART)). This test is done by a small prick on one of your fingers to get a drop of blood. The drop of blood will be used to count the number of CD4 cells in your body.

- If you are HIV positive, and you agree and give permission, personal information will be collected from your personal files that are kept at the hospital or clinic that you attend. This will provide us with information to better understand how HIV and the treatment you receive for HIV influence your health.

#### **What do you have to do before coming to the study?**

- We ask that you do not eat or drink anything (except for water) from the previous night 22:00 (ten o'clock). This will help to see if your blood sugar levels are normal.
- Please bring along all the medication that you are currently drinking
- Please bring along your South African ID document
- Please bring along your clinic book or medicine sheet that contains all your medication that is prescribed to you

#### **Will you benefit from taking part in this research?**

When you are finished for the day, some of the results will be given back to you. This will include:

- Blood pressure
- Blood sugar levels
- Heart function (electrocardiogram)
- Lung function (spirometry)
- How hard the bone in your forearm is (bone mineral density)
- How strong your muscles in your hand / forearm (hand grip strength) and legs (chair stand / rise and walk test) are
- Your height and weight
- Your HIV status and most recent CD4 count – if you gave permission for the test to be done and you want to know your status

If you participate you will also help us to understand what the risks are to your health. If we know what the risks are we can help the government to set up policies that will address this health risks in order to help other South Africans, like you, to have better health.

**Are there any dangers involved in you taking part in this research?**

Most of the measurements that will be performed won't hurt or harm you in any way, but you might experience the following:

1. If you give permission to a blood sample, you might feel uncomfortable or scared. We want to make sure that you are not hurt in any way and therefore we will use a qualified nurse that has a lot of experience. She will talk to you and explain to you everything that she is going to do in order for you to feel at ease. Some of this blood will be used (tested) to help us to understand what the reason(s) are that some people get non-infectious (non-communicable) diseases (such as heart attack and stroke) as well as high blood sugar (Type 2 Diabetes) and high body weight (obesity) and others may not. All the blood tests and experiments will only look at the reasons that change your chance of getting non-communicable diseases of lifestyle.
2. Some of this blood will also be used to get genetic material (DNA and RNA) to look at genetic factors. Genetic factors (inherited from your parents) are like a book that tells your body how to work. Sometimes there are mistakes (genetic alterations) that cause an increase in your chance of getting non-communicable diseases (these are diseases of the heart and blood vessels (such as heart attack and stroke) as well as high blood sugar (Type 2 Diabetes) and high body weight (obesity). We want to look at these genetic mistakes to better understand how these diseases develop. We promise that all genetic tests and experiments will only focus on genetic factors that contribute to your chance of getting non-communicable diseases of lifestyle.
3. During some of the measurements (weight and height, body composition, ECG, and pulse wave velocity) you will be asked to remove some of your clothes keeping only your underwear or light clothing on. This might make you feel uncomfortable or shy. To help you feel less shy and uncomfortable the area where these measurements will be done will be private and closed off. This

means that no one will be able to see you and that only the person that will take the measurements and someone to help him / her will be with you.

4. You will be asked to do a test (strength test) in order to see how strong the muscles in your hand / forearm and legs are. Although this is not a very hard test to do, and it does not take very long (only a few minutes) you might get tired. The researcher will ask you to rise / stand up from a chair as well as to walk 6 meters. If you feel that you cannot do the test, you will not be forced to do it, and you can move on to the next station.
5. You will be asked not to eat or drink anything from 22:00 (ten o'clock) the night before you come to the study. You will only be allowed to drink water. You should also not eat any breakfast on the morning of the study and not drink coffee, tea, juice or cold drink. Not eating or drinking anything might make you feel uncomfortable or light headed (dizzy or faint). As soon as you arrive at the research study, we will take a blood sample (if you give us permission) and then we will give you a light breakfast to make you feel better.
6. Doing all of the measurements on the day of the study, will take the whole day. This might make you feel very tired. We will give you a lunch as well as tea / coffee / juice / water throughout the duration of the day at the seating / waiting area.
7. Being part of such a big study can be frightening and overwhelming. To prevent us from wasting your time and to make sure that you know where to go and what to do, there will be people available at all times to help you and show you where you have to go every time.
8. HIV testing will also be performed on the day of the study (with your permission). Being newly diagnosed with a long-lasting disease such as HIV might cause you to worry. To help reduce the worry, there will be a professional person (counsellor) that will come and talk to the whole group about HIV and the test they will do. They will explain everything to you. The counsellor will then take you alone to a private room where nobody can hear you when you talk to the counsellor. When they do the test, a small needle is used to prick your finger and

a little drop of blood is used to test for HIV. You can decide if you want to know your status. Whether the test is positive or negative, the counsellor will talk to you alone and give you all of the information that you need to know. If you are positive and you want to know your status, you will receive a letter that you can take to your clinic or hospital and they will help you with treatment.

There are more benefits than dangers / risks when you partake in the study.

**Who will see my personal information (data)**

When you arrive at the study, you will be given a unique number, and only this number will be used when you provide us with any personal information or when we do the measurements. No one, except the supervisor of this research will be able to identify you. All your information will be kept safe and secret and will be locked away. No one will have access to your information except the supervisors of this study. All of the information will be stored for 5 years after the study has finished.

The PURE study also takes place in other countries. The main country that is supervising this study is Canada. Because we have a contract with them, we have to share the data with them. Only the information you provide us within the questionnaires and the body measurements will be shared with them. We won't share your information from your HIV status or DNA with them. They will also keep your information safe and secret. They will not share your information with anyone else.

**Will you be paid to take part in this study and are there any costs involved?**

You will be provided with a breakfast when you arrive at the study. Furthermore, the measurements will take about a whole day, and therefore we will also provide you with lunch. Water / juice / coffee / or tea will also be provided.

There will not be any travel costs for you, since we will arrange for transport for you to the research facility and back to the point where you were picked-up. You will also receive R50.00 (fifty rand) for any expenses due to your attendance at the study. If you are referred to the hospital or clinic you can use this money for any expenses.

If you are fulltime employed we will make special arrangements with your employer for you to be able to take part in the study. If you lose your work income for the day you will be compensated for the day (one day of work).

**Is there anything else that you should know or do?**

- If you have any questions that the fieldworkers cannot answer you can ask that the researcher explains it to you. You can contact the researcher, Dr Lanthé Kruger at 018 299 2093 or [lanthe.kruger@nwu.ac.za](mailto:lanthe.kruger@nwu.ac.za). You can also contact the researcher if you have any problems with the research.
- You can contact the Health Research Ethics Committee via Mrs Carolien van Zyl at 018 299 2089 or [carolien.vanzyl@nwu.ac.za](mailto:carolien.vanzyl@nwu.ac.za) if you have any concerns or complaints that have not been fully addressed by the researcher.
- You will receive a copy of this information and consent form for you to keep with you.

**How will you know about the findings?**

Results that are immediately available will be given to you in private and in person on the day of the study. Other results of the research will be shared with you as a group (everyone that was a part of this study) and with your community leaders verbally during a personal visit from the lead researchers. When we share the results with the community leaders and with the group we will never share personal information. This means that people will not be able to identify you, and you will be safe from any harm such as stigmatization.

**Storage of blood and urine samples**

The blood and urine samples that we collect from you will be stored in a special freezer that will protect it. Only we will have access to your blood and urine samples, and no one else. The samples will be kept in these freezers for an unlimited period of time until we have money available to test (analyse) them. All of the tests (analyses) will be related to this study (PURE) and what you give permission for. Some of your blood samples may be sent to laboratories outside of South Africa for analysis if it cannot be done here. If we are finished with the tests of the blood, we will destroy it so that no one else can use it.

**Declaration by participant**

By signing below, I ..... agree to take part in a research study entitled:

**Prospective Urban and Rural Epidemiology study (PURE)**

I declare / confirm that:

- I have read this information and consent form and it is written in a language that I understand and is comfortable with.
- I have had a chance to ask questions and all my questions have been answered to my satisfaction.
- I understand that taking part in this study is completely my choice and I have not been forced to take part.
- I may choose to leave the study at any time and will not be penalised or judged in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

**If you want to get tested for HIV you have to give permission here below:**

**Yes, I want to get tested for HIV**

**No, I don't want to get tested for HIV**

**If you want to know your HIV status you have to indicate it to us here below:**

**Yes, I want to know my HIV status**

**No, I don't want to know my HIV status**

**Do you give permission that we may have access to your medical records at the hospital or clinic?**

**Yes, I give permission**

**No, I don't give permission**

**Do you give permission that we may collect your genetic material from your blood sample?**

**Yes, I give permission**

**No, I don't give permission**

**Do you give permission that your genetic samples may be analysed outside of South Africa if it cannot be done here?**

**Yes, I give permission**

**No, I don't give permission**

**Do you give permission that some of your blood samples may be analysed outside of South Africa if it cannot be done here?**

**Yes, I give permission**

**No, I don't give permission**

**Do you want to be contacted when there are any NEW research studies that will take place within your area?**

**Yes, I want to be contacted**

**No, I don't want to be contacted**

Signed at (*place*) ..... on (*date*) ..... 20....

.....  
**Signature of participant**

.....  
**Signature of witness**

**Declaration by person obtaining consent**

I (*name*) ..... declare that:

- I explained the information in this document to .....
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use an interpreter.

Signed at (*place*) ..... on (*date*) ..... 20....

.....  
**Signature of person obtaining consent**

.....  
**Signature of witness**

**Declaration by researcher**

I (*name*) ..... declare that:

- I explained the information in this document to .....
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use an interpreter.

Signed at (*place*) ..... on (*date*) ..... 20....

.....  
**Signature of researcher**

.....  
**Signature of witness**

## ADDENDUM A

### SUMMARY FOR DATA COLLECTION (2005 – 2015) AND INTENDEND FUTURE USE FOR THE PROSPECTIVE URBAN AND RURAL EPIDEMIOLOGIC (PURE) STUDY

WHAT WAS COLLECTED?	WHAT INFORMATION DOES THIS GIVE US?
1. Blood sample	1.1 DNA damage due to environmental factors 1.2 Genetic factors related to non-communicable diseases 1.3 Indication of liver function 1.4 Clotting factors related to non-communicable 1.5 Risk markers for non-communicable diseases 1.6 Indication of bone health 1.7 Indication of nutritional status
2. Urine sample	2.1 Indication of kidney function 2.2 Indication of salt intake 2.3 Hypertension markers
3. Hair sample	3.1 Presence of toxins (fumonisin mycotoxins)
4. Body composition (Anthropometrics)	4.1 Height 4.2 Weight 4.3 Amount of fat in the body 4.4 Amount of muscles in the body 4.5 Amount of water in the body 4.6 Waist circumference 4.7 Hip circumference 4.8 Head circumference 4.9 Arm circumference 4.10 Leg circumference 4.11 Skinfolds
5. Blood pressure	5.1 To see if the blood pressure is too high or too low.
6. Pulse wave velocity	6.1 Indication of the flexibility of the arteries.
7. Electrocardiograph	7.1 Indication of heart function.
8. Vascular sonar (intima-media thickness)	8.1 Indication of blockages in the blood vessels.
9. Bone mineral density	9.1 Indication of the strength of the bones in the arm.
10. Lung function test (spirometry)	10.1 Indication of lung function.
11. Hand grip strength	11.1 Indication of the strength of the muscles in the hand.
12. Chair rise/stand test	12.1 Indication of the strength of the muscles in the legs.
13. 6 metre walk test	13.1 Indication of the strength of the muscles in the legs.
14. HIV test and CD4 count	14.1 Test for HIV and to test for the levels of CD4 cells in the body.
15. PURE Adult questionnaire	15.1 Provides demographic information. 15.2 Provides information regarding tobacco and alcohol use.

	<p>15.3 Provides information regarding the use of medication.</p> <p>15.4 Provides information regarding your health.</p> <p>15.5 Provides information regarding violence and injuries.</p> <p>15.6 Provides information on major personal events.</p> <p>15.7 Provides information on female health.</p> <p>15.8 Provides information on support systems used.</p> <p>15.9 Provides information on consumer habits.</p> <p>15.10 Provides information on work-, financial-, and home related stress.</p> <p>15.11 Provides information regarding your neighbourhood.</p> <p>15.12 Provides non-personal information regarding people living close to you who have HIV/AIDS.</p>
16. PURE Family census questionnaire	16.1 Provides demographic- and health information on family members currently living within the household.
17. PURE Physical activity questionnaire	17.1 Provides information on the type, duration and frequency of physical activity.
18. International Physical Activity Questionnaire (IPAQ)	18.1 Provides additional information on the type, duration and frequency of physical activity.
19. PURE Health Services questionnaire	19.1 Provides information on health services, health related expenditures, medication use and health knowledge.
20. PURE Annual contact form	20.1 Provides mortality and morbidity information regarding participant and members of household.
21. PURE Event reports	21.1 Provides information regarding new diagnoses of non-communicable disease(s).
22. PURE Verbal Autopsy questionnaire	22.1 Provides information regarding death of participants.
23. PURE: EPOCH 1: Environmental Profile of a community's health	23.1 Provides information regarding community.
24. PURE: EPOCH 2: Environmental Profile of a community's health	24.1 Provides information regarding community.
25. PURE Community profile questionnaire	25.1 Provides information regarding community.
26. Assessing neighbourhood walkability	26.1 Provides information regarding community.
27. Mental health questionnaire: MHC-SF	27.1 Provides information on emotional-, social-, and psychological wellbeing.
28. Mental health questionnaire: SWLS	28.1 Provides information regarding satisfaction with life.
29. Mental health questionnaire: AFM	29.1 Affectometer provides information regarding positive mental health.
30. Mental health questionnaire: MLQ	30.1 Measures to what extent respondents feel their lives are of meaning. Measures how engaged and motivated respondents are in efforts to find meaning or deepen their understanding of meaning in their lives.
31. Mental health questionnaire: PHQ-9	31.1 Provides information on possible mental health disorders.

32. Mental health questionnaire: K6	32.1 Provides information psychological distress (depressive and anxiety symptoms).
33. Mental health questionnaire: MRG	33.1 Provides information on the most meaningful things, most important relationships and most important goals.
34. Mental health questionnaire: MMSE	34.1 Provides information on positive impairment.
35. Bone health questionnaire	35.1 Provides information regarding risk factors for bone health. 35.2 Provides information regarding bone fractures.
36. HIV and stigma questionnaire	36.1 Provides information regarding attitudes and stigma on HIV/AIDS.
37. Medicine use questionnaire	37.1 Provides information regarding use of chronic medication.
38. Quantitative Food Frequency Questionnaire (QFFQ)	38.1 Provides quantitative information regarding frequency of dietary intake. 38.2 Provides quantitative nutrient information. 38.3 Provides quantitative information on nutritional status.
39. 24-hour recall dietary intake	39.1 Provides information of dietary intake over the past 24 hours.

### Declaration by participant

By signing below, I ....., ID number: ..... give permission that all of my data (information obtained from questionnaires, personal communication and interviews, physical measurements, and biological samples) that was voluntarily collected from me during the entire duration of the **Prospective Urban and Rural Epidemiology study (PURE) study** (between January 2005 - December 2015) may be used for any further analyses (primary and secondary), however, with the understanding that any analyses and its related results will only be relevant to the scope of the **Prospective Urban and Rural Epidemiology study (PURE) study**, and for which I gave permission (written informed consent).

I further agree to the secure storage and archiving of all of my data on the premises of the North-West University, Potchefstroom Campus. I understand that all of my data that was collected between January 2005 and December 2015, will be stored for an unspecified period until such time is suitable for appropriate further analyses (primary and secondary), and that it will be kept anonymously to everyone except the principle investigator.

Signed at (*place*) ..... on (*date*) ..... 20....

.....  
**Signature of participant**

.....  
**Signature of witness**

.....  
**Signature of researcher**

.....  
**Signature of witness**

**ANNEXURE C: ETHICS APPROVAL CERTIFICATES OF THE PURE  
STUDY 2005**

**ANNEXURE D: ETHICS APPROVAL CERTIFICATES OF THE PURE  
STUDY 2010**

**ANNEXURE E: ETHICS APPROVAL CERTIFICATES OF THE PURE  
STUDY 2015**

**ANNEXURE F: ETHICS APPROVAL CERTIFICATE OF THIS STUDY**